203GT

User manual

Heating regulator

203GT is a new generation heating regulator. Its versatility, intelligence and clarity have made it an ideal heating regulator for all kinds of water circulation heating systems.

In addition to heating control, 203GT has a number of other control and alarm functions for facilities.

Measurement information can be read, settings and controls can be checked and adjusted, and alarms can be received and acknowledged remotely via a GSM telephone's text messages. A GSM modem (optional equipment) must be connected to 203GT to enable GSM use.

LonWorks® MODBUS®

FOR STARTERS

Congratulations on your excellent choice! You have arquired a diverse new generation heating regulator designed for residental and office buildings - most a top - of - the - line product which can be adapted to the most diverse locations and heating systems.

Next we will introduce the regulator and the basic principles for using the user manual.

Userpanel

Regulating circuit code indicates the regulating circuit in question (heating circuit H1 shown here).

Browse button moves the > cursor up and down.

Group select - button moves you from one regulating to the next. The regulating circuits are: **H1,** heating regulating circuit, **H2,** heating regulating circuit and **HW**, domestic hot water regulating circuit.

The example shows the regulating circuit's operating mode.

Symbols which indicate actuator control mode.

- Regulator opens the 3-point controlled actuator.
- Regulator closes the 3-point controlled actuator.
- Height up the pillar shows the position of the voltage controlled actuator.
- Valve is fully open (100%) and the control voltage is 10 V.
- Valve is fully closed (0%) and the control voltage is 0 V or 2 V (2 ... 10 V actuator).

Decrease button

OK button

Increase button When you press + button in adjoining basic display mode, the regulator displays all the measure-ment results in turn and then returns to the basic display mode.

INFO button -gives operating instructions and additional informati-on on the display in different situations.

ESC-press to return to the previous display

Remote control options:

Remote control via a GSM phone
Most of 203GT's user level functions can also be carried out via GSM phone text messages.

Text message use is illustrated on page 18.

LÄMPÖÄSSÄ 203GT

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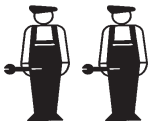

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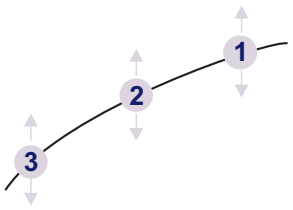
SETTINGS FOR HEATING CURVE

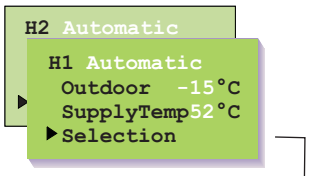


The basis for an even room temperature is a characteristic heating curve of just the right shape. The right shape for a characteristic heating curve depends on many factors.
In 203GT the characteristic heating curve can be adapted to exactly meet the needs of the facility from three points;

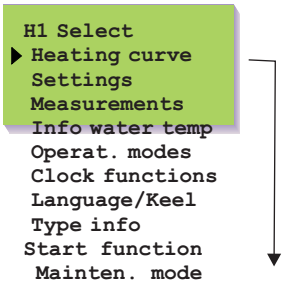
1. outdoor temperature of -20 °C
2. outdoor temperature of 0 °C
3. outdoor temperature of +20 °C

203GT prevents the setting of an incorrectly shaped characteristic heating curve. It automatically suggests an adjustment.

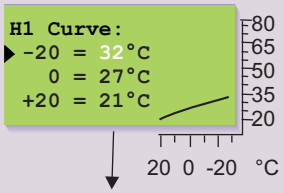
OPERATING INSTRUCTION:



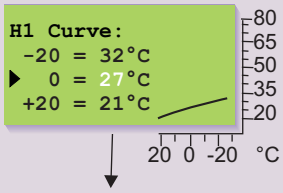
Press **ESC** until the display no longer changes.
You are then in the "Selection" display shown in the adjoining picture.
Press **OK.**
Use the button to move from one regulating circuit to the next (H1, H2).



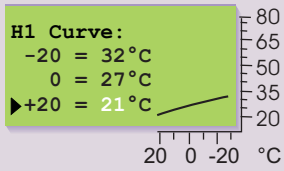
Press the button to move cursor to "Heating curve"
Press **OK.**



Press **OK.**
Press the **-** or **+** button to set the supply water temperature at an outdoor temperature of -20 °C.
Press **OK.**

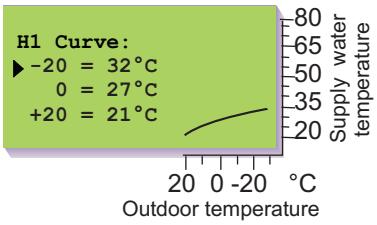


Press **OK.**
Press the **-** or **+** button to set the supply water temperature at an outdoor temperature of 0 °C.
Press **OK.**



Press **OK.**
Press the **-** or **+** button to set the supply water temperature at an outdoor temperature of -20 °C.
Press **OK.**
Exit with **ESC.**

CURVE INTERPRETATION:



When the outdoor temp. is:
-20 °C, the supply water is +32 °C
0 °C, the supply water is +27 °C
+20 °C, the supply water is +21 °C

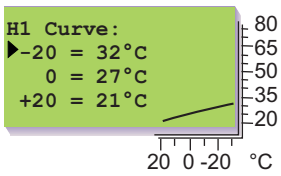
Attention!

The temperature of the supply water may vary from the curve if a reduced operation mode, room, wind or sun compensation has been connected to the regulator or if one of the limiting functions limits the temperature (see p. 11).
If the outdoor sensor is disconnected or if the sensor is broken, the regulator assumes that the outdoor temperature is 0 °C (use during construction without the outdoor sensor).

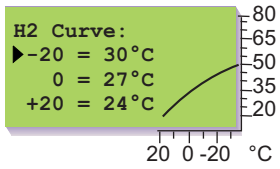
Instructions for setting the curve

EXAMPLES OF DIFFERENT HEATING SYSTEMS:

a) Floor heating



b) Normal radiator network (factory setting)



INSTRUCTION:

If the room temperature drops in subzero weather, raise the curve setting at -20 °C.
If the room temperature rises in subzero weather, lower the curve setting at -20 °C.
If the room temp. feels chilly at zero degree weather, raise the curve setting at 0 °C.
In this way you can set the regulating curve to meet the heating needs of your facility.

ATTENTION!

Wait a sufficient amount of time after the adjustment so the change has time to effect the room temperature.

Surface mounted thermostat CO1A

AC 250V 15 (2,5) A

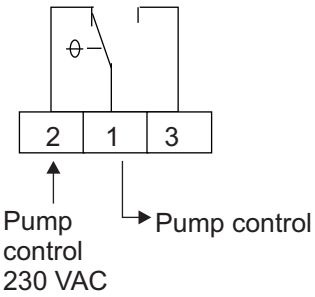
Houses with floor heating

Set the 203GT regulator's maximum limit between +35 ... +40 °C and the minimum limit between +20 ... +25 °C.

In floor heating solutions it is important to make sure that exessively hot water which could damage structures or surfaces doesn't ever get into the network. A mechanical thermostat should be installed on a supply water pipe which stops the circulation pump in case of overheating. Ouman Oy keeps CO1A surface mounted thermostats in stock that are suitable for this purpose. Set the thermostat at 40 ... 45 °C.

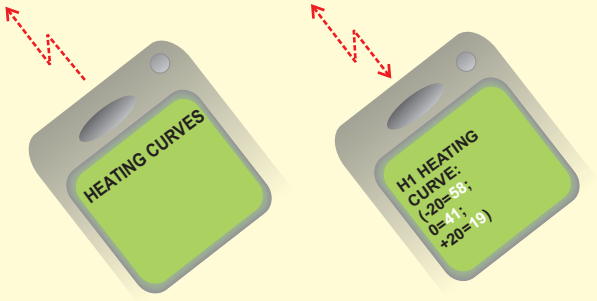
Model	Set point range °C	Differential range °C	Temp. of cover, °C
CO1A	+20...+90	7	-35...+120

Surface mounted thermostat's C01A connection:



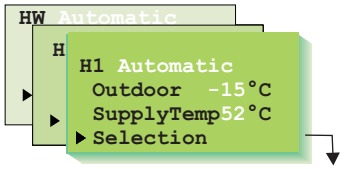
PATENTED GSM CONTROL

KEYWORDS:
Heating curves
H1 Heating curve
H2 Heating curve

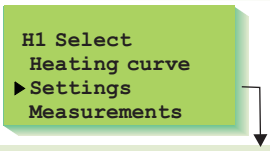


SETTINGS Browsing, making changes

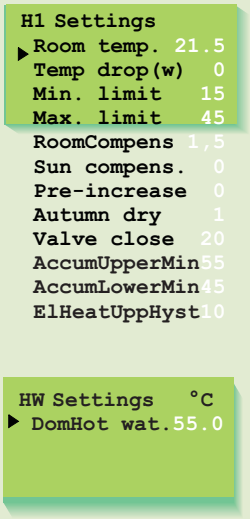
In 203GT the regulator is controlled by many different settings. Settings are selected according to sensor connections and geothermal heating selection (is it full effect or limited effect geothermal heating in use, see page p. 24).
By browsing you can see which settings you have in use.
Browsing and setting changes occur in the following way:



OPERATING INSTRUCTION:
Press **ESC** until the display no longer changes.
You are then in the "Selection" display shown in the adjoining picture.
Press **OK.** Press the button to move from one regulating circuit to the next (H1, H2, HW).



Press the button to move cursor to "Settings". Press **OK.**



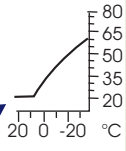
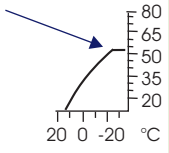
Changing the heating regulating circuit setting:

Press the button to move the cursor to the setting that you want to change. Press **OK.**
Press the **-** or **+** button to change the setting. Press **OK.**
Exit with **ESC.**

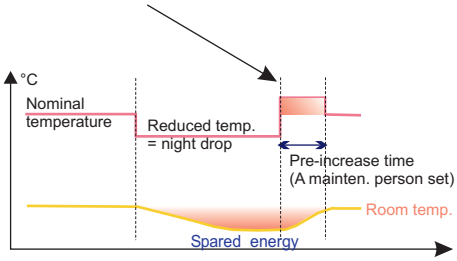
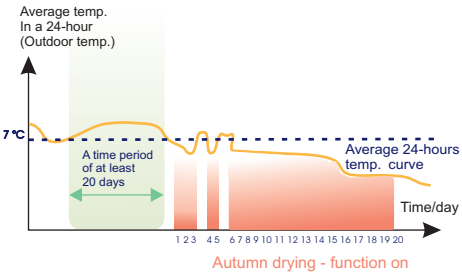
Changing the domestic hot water temperature:

Use the button to move to domestic hot water regulating circuit (HW).
Press **OK.**
Press the **-** or **+** button to change the setting. Press **OK.** Exit with **ESC.**

INFORMATION ABOUT SETTINGS:

Settings:	Factory settings:	Range:	Explanation:	Attention!
Room temp.	21.5°C	5.0...45.0°C	Room temperature setting, which user has set.	During temperature drop period regulator use the calculated room temp. setting, which is **Room temp. - [Temp drop(w) / Room compens.]**
Temp drop (w) (supply water)	0°C	0...35°C	The supply water temperature drop, determined by the clock program or the external home/away switch. (Room compensation takes a desired drop in room temperature into account)	
Min. limit	15°C	5...95°C	Minimum allowed supply water temperature. Set the minimum limit for floor heating circuit tiled floors between 20...25°C, to ensure a comfortable temperature and removal of moisture in the summer.	**Minimum limit** 
Max. limit	45°C	15...125°C	Maximum allowed supply water temperature. The maximum limit prevents the temperature in the heating circuit from rising too high, preventing damage to pipes and surface materials. If, e.g., the characteristic heating curve setting is incorrect, the maximum limit prevents excessively hot water from entering the network. Set the upper limit for floor heating between 35...40°C.	**Maximum limit** 

Additional information about settings

Settings:	Factory Settings	Range:	Explanation:	Attention!
Room compens.	1.5 °C	0.0...7.0°C	Room compensation ratio: If the room temperature is different than what it is set at, the room compensation corrects the supply water temperature. (Eg.) If the room compensation is 4 and the room temperature has risen 1,5 °C above the setting, the regulator drops the supply water temperature 6 °C (4x1,5 °C =6 °C). An appropriate room compensation ratio for floor heating is usually between 1.5 - 2.0°C.	**Room sensor** (TMR) must be connected (H1:meas.3, H2:meas. 6, or net).
Wind.compens.	0 °C	0... 7 °C	A house cools down in windy weather. In that case the wind compensation raises the supply water temperature. The reading indicates the maximum amount that the wind compensation can raise the supply water temperature.	**Wind sensor** must be connected, the same sensor for regul. circuits H1 and H2 (meas. 6 or net).
Sun compens.	0 °C	0...-7 °C	The room temperature of a house having large windows with a south exposure rises on a sunny day even in subzero weather. The reading indicates the maximum amount that the sun compensation can drop the supply water temp.	**Sun sensor** must be connected, the same sensor for regul. circuits H1 and H2 (meas. 6 or net).
Pre-increase 	0°C	0...25 °C	The automatic pre-increase in degrees which occurs after a reduced operation (nighttime drop) The pre-increase makes it possible to raise the room temperature faster to a nominal room temperature (day temp.) after a reduced operation. A maintenance person must set the length of the pre-increase time (see maintenance mode p 21).	The setting appears if pre-increase time has been set in maintenance level settings. (see p. 21)
Autumn dry  Average temp. In a 24-hour (Outdoor temp.) 7 °C A time period of at least 20 days Average 24-hours temp. curve Time/day 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 Autumn drying - function on	2 °C	0...15 °C	In autumn, the temperature of the supply water is automatically raised for 20 days through autumn drying. Autumn drying is activated when the average temperature in a 24-hour period has continually been above 7 °C for a period of at least 20 days and after this drops below 7 °C. Autumn drying is activated during the next 20 days whenever the average temperature in a 24-hour period is under 7 °C. The autumn drying setting indicates how much autumn drying raises the supply water temperature. The original factory setting is 1 °C.	
Valve close	20°C	5...50 °C	Valve closed during the summer: The outdoor temperature limit at which the regulator closes the valve in H1 circuit. Circuit 2 is often used to warm up the wet places (sauna stove, lavatory and so on) Because it is important to warm up the wet places also summer time, the valve in circuit 2 is not closed.	

Additional information about settings

Settings:	Factory Settings	Range:	Explanation:	Attention!

Full effect geothermal heating (see also p. 25-26).

Accumulator's upper part min. temperature *"AccumUpperMin"*	55°C	5...55°C	Temperature setting of measurement 9. **A compressor running command is given when** the temperature of the accumulator's upper part (meas. 9) drops below [*"AccumUpperMin"* **-** (*"AccumUppHyst"* / 2)]. The compressor stops running when the temperature of the accumulator's upper part (meas. 9) rises above the [*"AccumUpperMin"* **+** (*"AccumUppHyst"* / 2)] temperature **and** the temp. of the accumulator's lower part is high enough (see the AccumLowerMin setting).
Accumulator's lower part min temperature *"AccumLowerMin"*	45°C	30...55°C	Temperature setting of measurement 10. **A compressor running command is given when** the temperature of the accumulator's lower part (meas. 10) drops below the *"AccumLowerMin"* setting. **The compressor stops running when** the temperature of the accumulator's upper part (meas. 9) rises above the [*"AccumUpperMin"* **+** (*"AccumUppHyst"* / 2)] temperature **and** the temperature of the accumulator's lower part (meas. 10) rises above the [*controller indicated H1 supply water temp.* **+** 5° C] **and** the temperature of the accumulator's lower part (meas. 10) rises above the ["AccumLowerMin "**+** "AccumLowHyst"] temperature
Additional hysteresis for electrical heating resistor control *"ElHeatUppHyst"*	10°C	2...10°C	**The electrical heating resistor switches on if** **1.**Compressor control has been on for an hour and the temperature of the accumulator's lower part has not risen a degree **or** the compressor alarm is active and an attempt has been made to restart the compressor after a delay time of 5 minutes. **2.**The temperature of the compressor's upper part is below [*"AccumUpperMin"* **-** (*"AccumUppHyst"* / 2) **-** *"ElHeatUppHyst"*] or the temperature of the accumulator's upper part (meas.9) is below the [*controller indicated H1 supply water temp.* **-** "*El.HeatUppHyst"*] (This calculation takes into account that the temperature of the controller indicated H1 supply water temperature is a maximum of 50° C.) **The electrical heating resistor switches off when** the temperature of the accumulator's upper part (meas. 9) is above the [*"AccumUpperMin"* **-** (*"AccumUppHyst"* / 2)] temperature **and** the temp. of the accumulator's upper part is above the [*controller indicated H1 supply water temp*] **or** the temperature of the accumulator's upper part is above 55° C

Partial effect geothermal heating (see also p. 27-28)

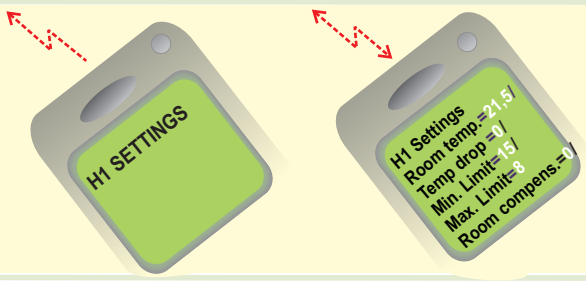
"AccumUpperMin"	55°C	5...80°C	The same as full effect geothermal heating except that with partial effect geothermal heating the controller uses a calculated temperature for the accumulator's upper part (outdoor compensation) in place of the "AccumUpperMin" setting. (Additional information about outdoor compensated "Upper part setting" on p. 27)
"AccumLowerMin"	45°C	30...55°C	The same as full effect geothermal heating.
"El.HeatUppHyst"	2°C	2...10°C	The same as full effect geothermal heating except that in partial effect geothermal heating the electrical heating resistor and compressor can be on at the same time. The electrical heating resistor switches on without an hour's delay when the conditions for electrical heating control have been met.

Domestic hot water regulating circuit			
DomHot wat.	55.0°C	5.0...95.0°C	Domestic hot water temperature setting. Because of danger of bacteria, it is recommended that the domestic hot water temperature is not set below +55°C.

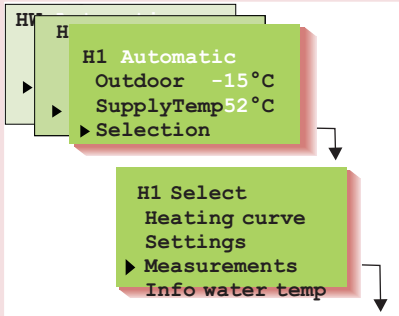
PATENTED GSM CONTROL

KEYWORDS:

H1 Settings
H2 Settings
DHW Settings



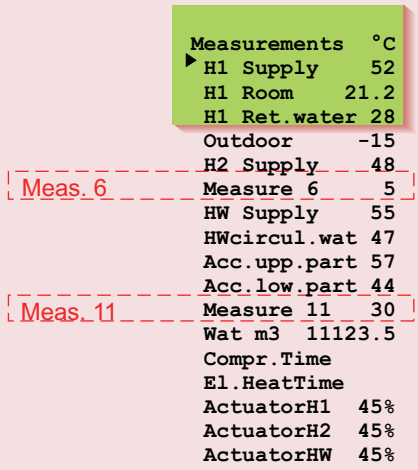
The regulator can be connected to 14 different measurement data at the same time (11 NTC measurements + 3 digital inputs).Measurement data can also be read through the bus. Also the position of the voltage controlled (0...10V or 2...10V) actuator can be seen. Measurements 6 and 11 can be used to indicate external alarms (additional information on alarms page 17) ATTENTION! **Only the measurements connected to the regulator appear on the display.**



OPERATING INSTRUCTION:

Press **ESC** until the display no longer changes.
You are then in the "Selection" display shown in the adjoining picture.
When you press the **+** button in the basic display mode, the regulator displays all the measurement results in turn and then returns to the basic display mode. You can also browse measurement data in the "Measurements" display.
Press **OK.**

Press the button to move cursor to "Measurements". Press **OK.**



Browsing through measurements:

Press the button to browse different measurements.
Press **ESC** to exit from the measurements display

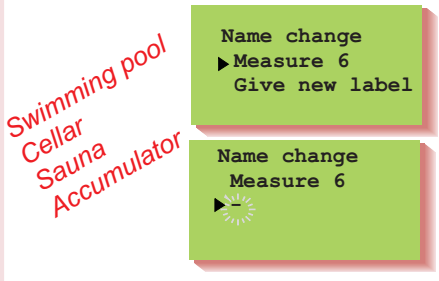
Every sensor has it's own typical range. (Eg. outdoor sensor 50...+ 50 °C). If the sensor's measured value is outside of this range, a - or + character will appear on the measurements display in place of the sensor's measured value to indicate whether the value is above or below the range.

If there is a sensor defect the regulator gives an alarm (see p. 17) and "err" will appear in place of the measured value.

Measure 6: Can be used as a free temperature measurement that can be labeled or as a measurement that effects regulation (H2 room, wind or sun compensation, see Special maintenance, p. 32-33)

Measure 11: Measurement 11: If meas. 11 is not reserved for compressor upper part hot gas temp measurement, meas. 11 can be used as a free temp. measurement that can be labeled.

Relabeling measurements 6 and 11:
Move the cursor to the measurement (6 or 11) that has to be relabeled. Press **OK.**

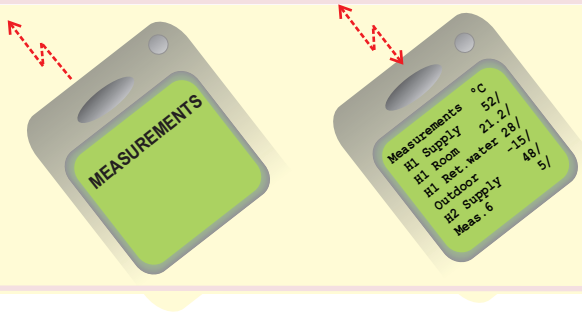


Move the cursor to "Give new label". Press **OK.**
A letter "-" appears on the display. You can move forward or backward in the character row by pressing the **+** or **-** button. Confirm the letter/character by pressing **OK**, then the same letter/character that you selected will blink in the next space. The character that has been fed last can be deleted by pressing **ESC**. If you press the **ESC** button for a while you can delete the new name and the previous name remains in effect. When you have written the name, press **OK** for a while (over 2 sec.), to exit from the data entry mode and the name that has been written will come into effect.

Text editor's characters in the order in which they appear: "Empty" . - numbers 0... 9 letters A ...Z a … z ä ö å

PATENTED GSM CONTROL

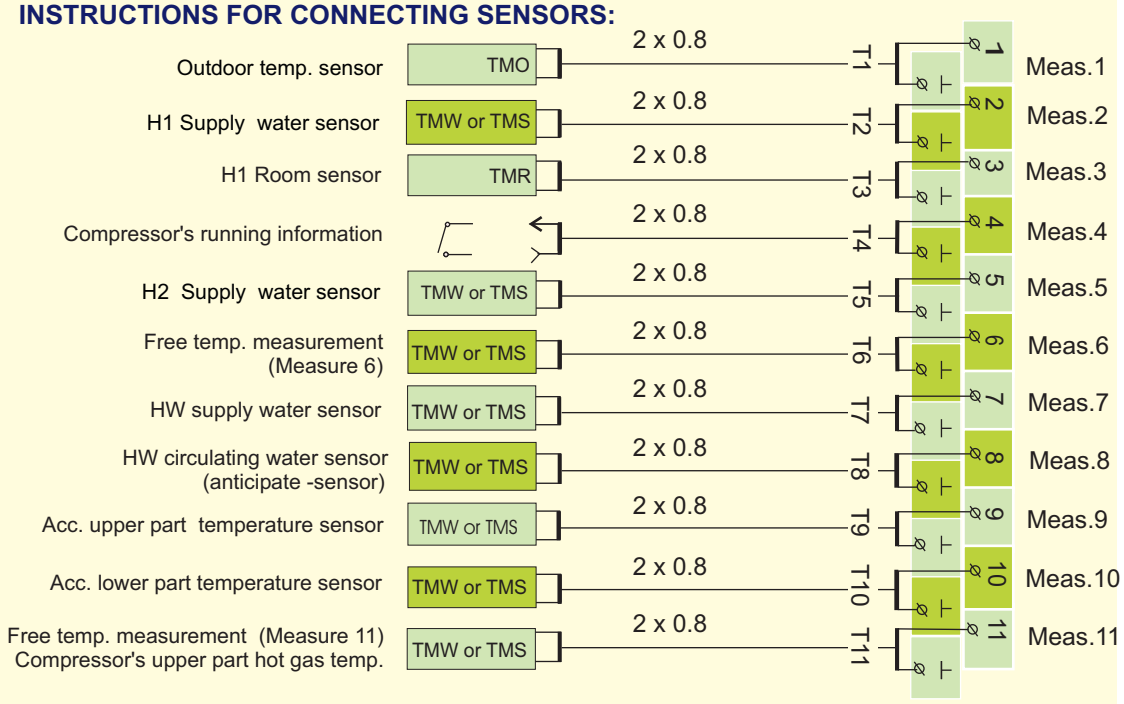
KEYWORD:
Measurements



MEASUREMENTS Additional information

Strip con-nector	Measure-ment:	Measurement information:	Setting range:	Attention!
1	Out temp	Outdoor temperature	-50...+50	Can be read through the net
2	H1 Supply	Supply water temperature in regulating circuit H1	0...+130	
3	H1 Room	Room temp. in regulating circuit H1 (room comp.)	-10...+80	Can be read through the net
5	H2 Supply	Supply water temperature in regulating circuit H2	0...+130	
6	Measure 6	Free measurement; name using the text editor	-10...+80	Interchangeable (p. 31). If several compens. are needed, the data must be read through the net and the wind is m/s and the light is lux (p. 36).
6	H2 Room	Room temp. in regulating circuit H2 (room comp.)		
6	Wind	Wind speed (% of sensor's range)		
6	Sun	Amount of light (% of sensor's range)		
7	HW supply	HW (domestic hot water) supply water temp.	0...+130	
8	HW circul.wat	Temp. measurement of HW return water. (an anticip. sensor is used improve the setting results, see page 21, Anticipate)	-10...+80	
9	Acc.upp.part	Accumulator's upper part temperature	0...+130	
10	Acc.low.part	Accumulator's lower part temperature	0...+130	
11	Measure 11	Free measurement; name using the text editor	0...+130	
11	Hot gas	Temp. measured from compressor's upper part		
	Wat m3	Measured water consumption of facility (m^3)	0...99999,9	Measurement data through a digital input or the bus.
	Compr.Time	Compressor's total running time (running time counter)		
	El.HeatTime	Electrical heating resistor's total running time in hours (running time counter)		
	ActuatorH1	Actuator position in regulating circuit H1		Appears only when using a 0...10V (2...10V) controlled actuator.
	ActuatorH2	Actuator position in regulating circuit H2		
	ActuatorHW	Actuator position in regulating circuit HW		

INSTRUCTIONS FOR CONNECTING SENSORS:



Resistance value table

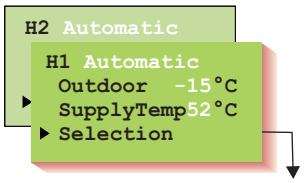
°C	Ω
-30	177 100
-25	130 400
-20	96 890
-15	72 830
-10	55 340
-5	42 340
0	32 660
5	25 400
10	19 900
15	15 710
20	12 490
25	10 000
30	8 064
35	6 531
40	5 330
45	4 368
50	3 602
55	2 987
60	2 490
65	2 084
70	1 753
75	1 482
80	1 259
90	917
100	680
110	511

Putting sensor into use and removing it from use:

If the outdoor sensor is not connected, the regulator assumes that the outdoor temperature is 0°C and a sensor fault message appears on the display (Outdoor temp err). When the outdoor sensor is connected, the regulator automatically takes it into use. **After adding other sensors you must go to start function!** (See page 16)

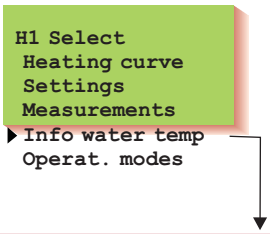
SUPPLY WATER INFORMATION

In this mode we can see which factors determined by the regulator make up the supply water temperature at the time of inspection.
The basis for this is the supply water temperature at the present outdoor temperature according to the characteristic heating curve.



OPERATING INSTRUCTION:

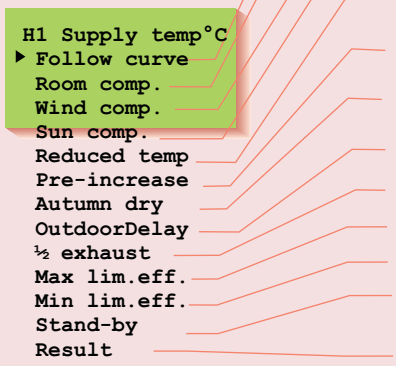
Press **ESC** until the display no longer changes.
You are then in the "Selection" display shown in the adjoining picture.
Press **OK.**
Press the button to move from one regulating circuit to the next (H1, H2).



Press the button to move cursor to "Info water temp". Press **OK.**

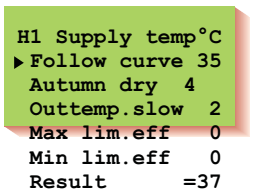
Press the button to browse factors which determine the supply water temperature.

Exit with **ESC.**



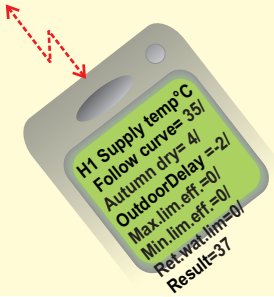
- Supply water temp. at the present outdoor temp. accord. to the curve
- Room comp.: Effect of room compensation on supply water/ RoomCompNigh: Effect of room compensation on supply water during reduced operation.
- Effect of wind compensation on supply water
- Effect of sun compensation on supply water
- Effect of clock controlled reduced operation mode on supply water (or a drop controlled by a home/away switch or GSM phone)
- Effect of pre-increase on supply water after reduced operation mode.
- Effect of automatic autumn drying on supply water
- Effect of outdoor temperature measurement delay on supply water
- Effect of exhaust fan at ½ power on supply water
- Supply water temperature drop due to maximum limit
- Supply water temperature increase due to minimum limit
- Effect of free temperature drop on supply water
- Present supply water temperature (C°) determined by the regulator

EXAMPLE



In the example, the supply water temperature according to the curve is 35 °C. Autumn drying raises it 4 °C. The outdoor temperature measurement delay drops the supply water temp. 2 °C. As a result, the regulator determines that the supply water temperature is +37 °C. (35+4-2=37).

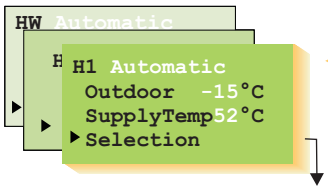
KEYWORDS:
H1 Info water
H2 Info water



OPERATING MODES

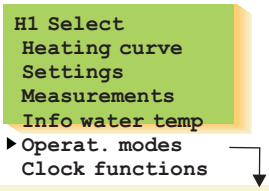
Each regulating circuit can be controlled with the operating modes mentioned below. The factory set automatic regulation is a normal regulating situation in which the clock controlled temperature drops are also possible.

The selected operating mode always appears on the basic display on the top line.

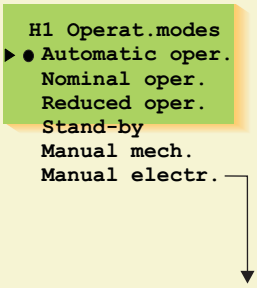


OPERATING INSTRUCTION:

Press **ESC** until the display no longer changes.
You are then in the "Selection" display shown in the adjoining picture.
Press **OK.**
Press the button to move from one regulating circuit to the next (H1, H2, HW).



Press the button to move cursor to "Operat. modes". Press **OK.**



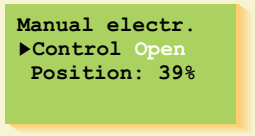
Press the button to browse operating modes.
The ● character indicates which operating mode has been selected.

Changing operating mode:

Move the cursor to the operating mode that you want. Press **OK.**
Exit with **ESC.**

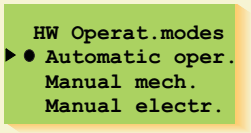
Manual operation of actuator mechanically:

No electricity to actuator.
Only mechanical manual operation of actuator is possible.



Manual operation of actuator electrically: Press **OK.**

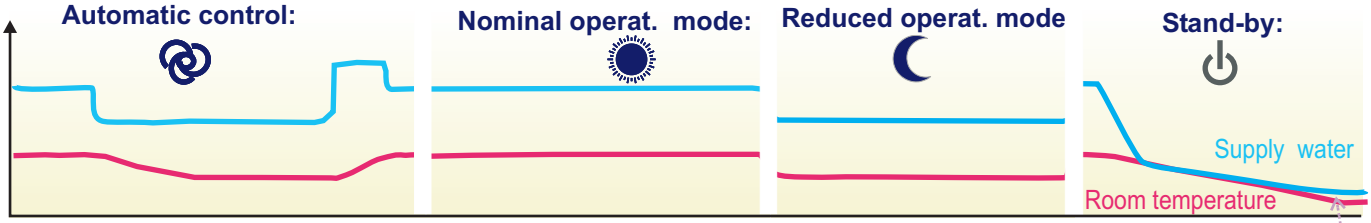
Press the **-** or **+** button to change the position of the actuator.
The direction the actuator is being run can be seen from the display.
The position's %-reading indicates the actuator`s position if a voltage controlled 0...10V or 2...10V actuator (0% = closed, 100% = open) is being used. Confirm the actuator position by pressing **OK.**
The valve can also be connected so that 100% is closed.



Operating modes in domestic hot water regulating circuit (HW)

Press the button to move to the HW-circuit.

Additional information about operating modes in heating regulating circuits H1 and H2:

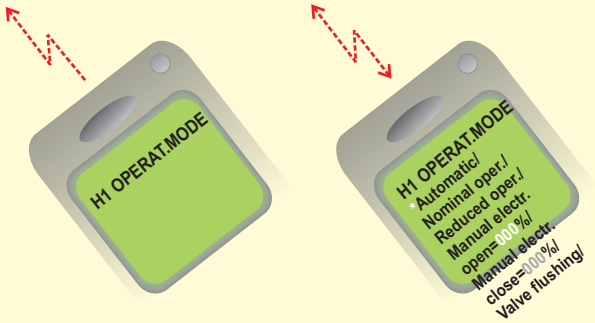


Automatic control:	Nominal operat. mode:	Reduced operat. mode	Stand-by:
Temperature drops occur according to the clock program.	The regulator keeps a nominal temperature on disregarding the clock program.	Continuous reduced temperature (nighttime drop) is on regardless of the clock program.	Free supply water temperature drop down to the freeze protect limit (stand-by function).

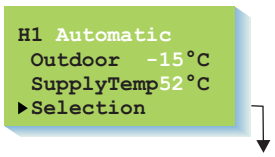
PATENTED GSM CONTROL

KEYWORDS:

H1 Operat.modes
H2 Operat.modes
DHW Settings



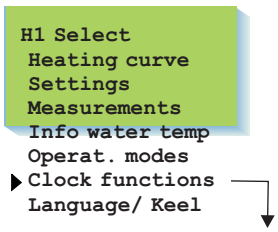
Setting the time happens in the following manner:



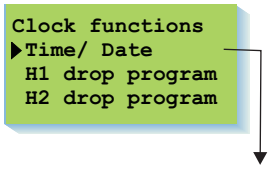
OPERATING INSTRUCTION:

Press **ESC** until the display no longer changes.
You are then in the "Selection" display shown in the adjoining picture.

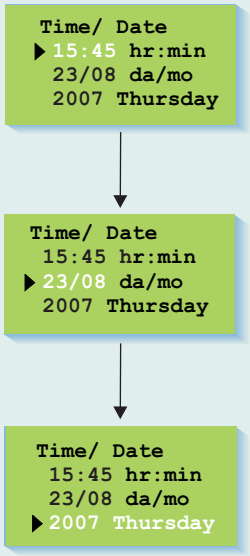
Press **OK.**



Press the button to move cursor to “Clock functions”. Press **OK.**



The cursor is at "Time/Date". Press **OK.**



Set the time:

The cursor is at time. Press **OK.**

The hours blink. Press the **-** or **+** button to set the hours. Press **OK.**

The minutes blink. Press the **-** or **+** button to set the minutes. Press **OK.**

Set the date: Press **OK.**

The day blinks. Press the **-** or **+** button to set the day. Press **OK.**

The month blinks. Press the **-** or **+** button to set the month. Press **OK.**

Set the year and weekday: Press **OK.**

The year blinks. Press the **-** or **+** button to set the year. Press **OK.**

The weekday blinks. Use the **-** or **+** button to set the weekday. Press **OK.**

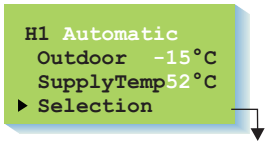
Exit with **ESC.**

Attention!

The 203GT regulator's clock registers summer time and standard time changes and leap years.
The battery lasts approx. 10 years.

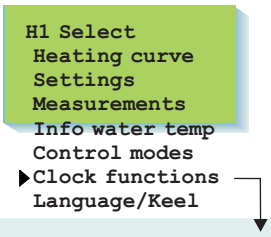
Clock programs - browsing, adding, deleting

With the freely programmable 24 hour/7 day clock you can drop the temp. for certain lengths of time (heat. circuits H1 and H2)

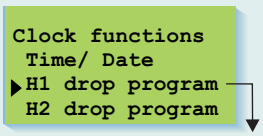


OPERATING INSTRUCTION:

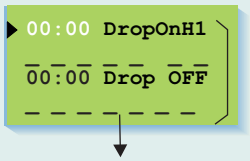
Press **ESC** until the display no longer changes.
You are then in the "Selection" display shown in the adjoining picture.
Press **OK.**



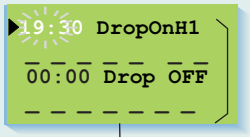
Press the button to move cursor to "Clock functions". Press **OK.**



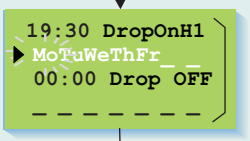
Press the button to move cursor to the regulating circuit whose time controls you want to access (browse, add or delete). Press **OK.**



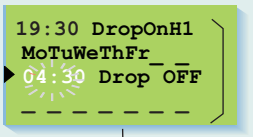
Browse/ location for additional programming:
Press the button to browse the clock programs which have been made. If you want to make additional programs, move cursor to first empty program block.



Set the start time for the temp. drop program: Press **OK.**
Temperature drop start time hours blink.
Press the **-** or **+** button to set hours. Press **OK.**
Minutes blink. Press the **-** or **+** button to set minutes. Press **OK.**

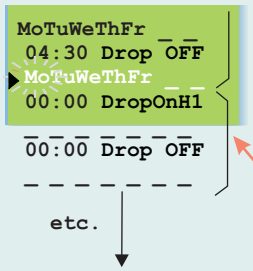


Set the weekdays (when the start time is effective):
Press the **-** or **+** button to select weekday.
The day is left unselected/ press the **-** -button to delete the selection.
The selection shown on the display is taken into use with the **OK** button.
Make your selection for each day and press **OK.**



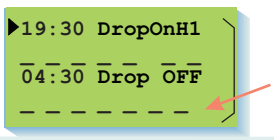
Set the end time for the temp. drop program: Press **OK.**
Hours blink. Press the **-** or **+** button to set hours. Press **OK.**
Minutes blink. Press the **-** or **+** button to set minutes. Press **OK.**

Set the weekdays (when the end time is effective):
Press the **+** button to select weekday.
The day is left unselected/ press the **-** to delete the selection.
The selection shown on the display is taken into use with the **OK** button.
Make your selection for each day and press **OK.**



There is always one program block inside the brackets (drop on and off).
The cursor moves to the beginning of the next program block (new brackets).
Continue programming as before or exit with **ESC.**

In the example the drop is in effect during the workweek between 19:30 and 4:30. On the weekend the drop begins on Friday evening at 19:30 and ends on Monday morning at 4:30.

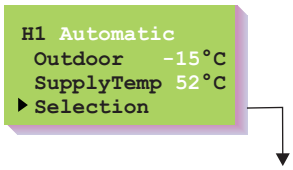


DELETING THE PROGRAM BLOCK:

You can delete the program block inside the brackets by deleting the weekdays in that program block with the **-** button.

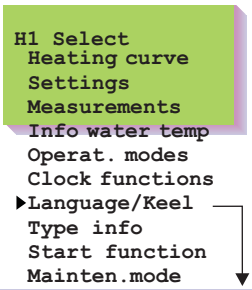
LÄMPÖÄSSÄ 203GT LANGUAGE/KEEL

The 203GT regulator is in two languages. The regulator has the most commonly used languages Finnish - Swedish or English - Eesti. The language of the regulator can be changed in the following manner:

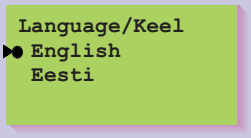


OPERATING INSTRUCTION:

Press **ESC** until the display no longer changes.
You are then in the "Selection" display shown in the adjoining picture.



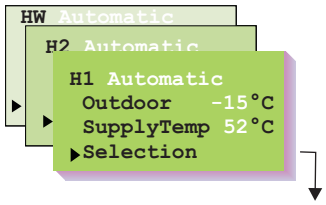
Press the button to move cursor to "Language/ Keel". Press **OK.**



Press the button to move the cursor to the language you want to use. Press **OK.**

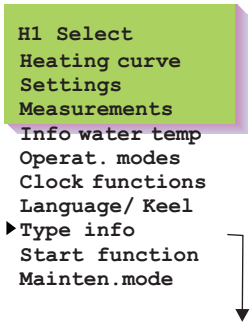
LÄMPÖÄSSÄ 203GT TYPE INFORMATION

Type information indicates which regulator is in question and which program version is in use. There are two heating circuits and one domestic hot water regulating circuit in the 203GT regulator.

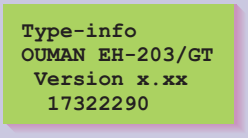


OPERATING INSTRUCTION:

Press **ESC** until the display no longer changes.
You are then in the "Selection" display shown in the adjoining picture.



Press the button to move cursor to "Type information". Press **OK.**

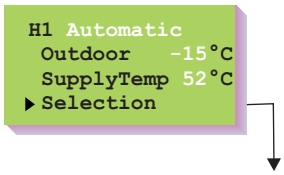


The version number informs the producer which version is in question.

The serial number is connected to the production process so the manufacturer can determine exactly which regulator is in question.

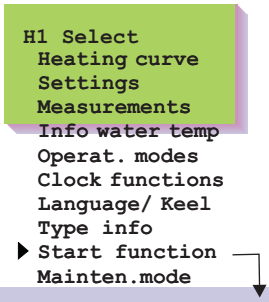
START FUNCTION Regulat. mode sel.

In the start function the regulator detects the sensors that are attached to it. The regulator takes the regulating circuits (H1, H2 and HW) into use according to the supply water sensors. The assumption is that there is a basic regulator in each regulating circuit. It is possible to change the heating regulating circuit (H1 and H2) to a self-learning regulator.
The start function also activates the sensor's fault alarms.
The basic regulator controls the supply water temperature according to the set heating curve.
The self-learning regulator automatically changes the characteristic heating curve according to the feedback from the room sensor. The self-learning maximum adjustment is 10%. The letter **i** on the heating curve display indicates that self-learning is in use.



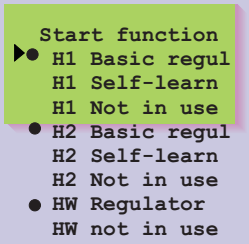
OPERATING INSTRUCTION:

Press **ESC** until the display no longer changes.
You are then in the "Selection" display shown in the adjoining picture.



Press the button to move cursor to "Start function". Press **OK.**

The regulator detects the sensors that are attached to it and shows possible regulating modes. The regulator's factory setting is a basic regulator.



Browsing:

Press the button to browse the possible regulator types in each regulating circuit. Exit with **ESC.**
The ● character indicates which regulator types have been selected from the different regulator circuits.

Changing the regulator type:

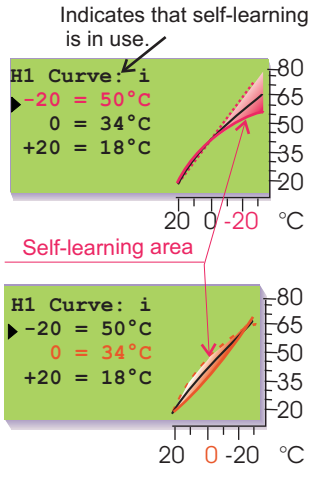
Press the button to move the cursor and press **OK.**

SELF-LEARNING INFORMATION:

Self-learning occurs if the room temperature varies at least 1 °C from the set value when the outdoor temperature is in a +5... -5 °C or -15... -25 °C range for at least 4 hours.

Automatic adjustment of the characteristic heating curve occurs at 0 °C or -20 °C. The adjustment rate is 1 °C in 4 hours. The maximum adjustment of the set curve is +/- 10%. If the characteristic heating curve setting is changed from the keyboard, GSM phone or control room, self-learning starts from the beginning.

The room sensor (TMR) has to be in use in order for self-learning to take place. The self-learning setting must not be used if the room compensation unit (TMR/P) is in use. Self-learning does not function during a temperature drop.



Examples of self-learning function:

If the outdoor temperature is between -15... -25 °C, self-learning occurs at the characteristic heating curve's -20 °C setting. For example, if the setting value is 50 °C, the self-learning area is 45... 55°C (+/- 10% of the set value).
If the outdoor temperature is between -5... +5 °C, self-learning occurs at the characteristic heating curve's -0 °C setting. For example, if the setting value is 34 °C, the self-learning area is 30... 38 °C (+/- 10% of the set value).

ALARMS!

203GT gives an alarm when a situation deviates from the norm. In the event of an alarm, the controller gives an alarm and an alarm message appears on the display. Also, the alarm relay contact closes. Note! Although the cause of the alarm has disappeared, the last alarm remains permanently on the display until it is acknowledged. If a GSM modem has been connected to the controller, the alarm will appear in the desired GSM phone as a text message. External alarms can also be connected to 203GT, e.g., leakage, network's water pressure, etc. (alarm labeling is done using the text editor). The controller gives an alarm if the temp of the accumulator's upper part rises above 95°C. In addition, with geothermal heating at full effect the controller gives an alarm if the controller switches on the heating resistor.

Sensor fault alarms:

```
Alarm!
03/04   11:46
Measurement 1
Outdoor temp err
```

In case of sensor fault, the regulator gives an alarm and a message appears on the display: Alarm! Measurement number and name and err. The alarm relay contact closes (strip connectors 31 and 32).

Risk of freezing alarm:

```
Risk of Freez!
02/02    22:34
Measurement 2
H1 supply  7
```

The regulator gives a risk of freezing alarm if the supply water temperature goes below the lower limit set for a free drop in the supply water or the lower limit set for the room temperature. The present supply water temperature appears on the display. The alarm relay contact closes (strip connectors 31 and 32). See special maintenance settings page 30.

Deviation alarm:

```
Deviation alarm!
06/05    18:30
Measurement 2
H1 supply 25
```

The regulator gives a deviation alarm if the supply water temp permanently deviates (factory setting 60 min) from the temp set for it by the regulator. (The maximum allowed deviation is listed in special maintenance under "H1 Dev. alarm" settings and the duration of the deviation that causes the alarm to go off is under settings "DevAlaDela", page 30.)

HW overheating alarm:

```
Overheating!
04/04   22:40
Measurement 7
HW supply 78
```

If the HW supply water temperature exceeds the HW alarm limit (factory setting 70 °C), the alarm goes off. The present supply water temperature appears on the display. The alarm relay contact closes (strip connectors 31 and 32). See "Settings", page 21.

EXTERNAL ALARMS:

Measurements 6 and 11 as alarms:

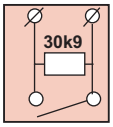
"Risk of moisture"

"Wastewater tank"

"Water pressure"

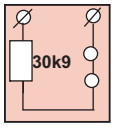
Measurements 6 and 11 can also be used to indicate external alarms (potential free switch). In that case a 30k9 resistor must be connected to the strip connector of the measurement in question.

Closing alarm



When the contact is open "1" appears on the display. When the switch closes, an alarm goes off and the alarm in question appears on the display.

Opening alarm

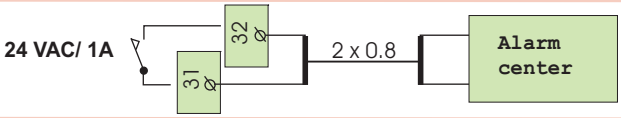


When the contact is closed "1" appears on the display. When the switch open, an alarm goes off and the alarm in question appears on the display.

Digital inputs as alarms

Digital inputs Dig1, Dig 2 and Dig 3 can be used for receiving external alarms. The alarms can be labeled according to topics, e.g., "water damage" (installation p. 34). When the contact connected to the digital input closes, an alarm goes off and "err" appears on the display. If the alarms are not labeled, "Alarm!, Dig 1 (2, 3) will appear on the display in the event of an alarm and the alarm relay contact closes (strip connectors 31 and 32).

CONNECTING THE ALARM RELAY:



ALARM ACKNOWLEDGEMENT:

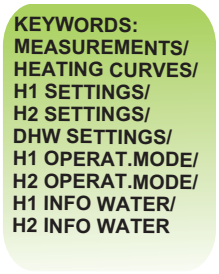
Turn the alarm off by pressing any button. The display will return to the mode it was in before the fault appeared or if there are additional sensor faults their alarm information will appear on the display. If you don't press the keyboard in 20 seconds the alarm will return to the display if the fault has not been corrected.

PATENTED GSM CONTROL

The GSM modem (optional equipment) offers an economical "miniature monitor solution". Alarm information is directed to the desired GSM numbers (1 and 2). See p. 37). In the event of an alarm, the regulator first sends a text to GSM1 that indicates the cause of the alarm. The alarm is acknowledged when the same message is sent back to the regulator via the GSM. If the GSM1 does not acknowledge the alarm in 5 minutes, the regulator will send the text message again to both GSM numbers.

GSM-FUNCTIONS

A GSM modem can be connected to 203GT, making it possible for the user to communicate with the controller via GSM phone text messages. (installation p. 37). A GSM phone can be used to carry out most of the user level functions in this manual, e.g., measurements, settings, heating curve settings, supply water info and the controllers operating mode. A GSM phone receives alarms which can be acknowledged by sending the alarms back to the controller.



COMMUNICATING WITH THE REGULATOR USING A GSM:

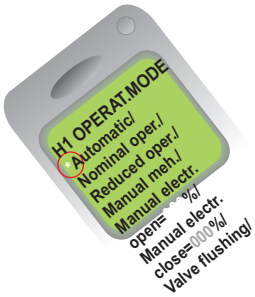
Send the following text message to the regulator:
KEYWORDS

If the regulator has a device ID (p. 37,38), always write the device ID before the key word (e.g., TC1 KEYWORDS). The regulator will send a list of key words via text message, which will help you obtain information about how the regulator operates. Each key word is separated by a / character.

Receiving information from the regulator:

Send a text message to the regulator using key words that it provides you. The regulator recognizes only one request at a time, so write only one key word/message. You can write the key word using capitals or small letters. (If the regulator has a device ID (see p. 37, 38), write the device ID in front of the key word.)

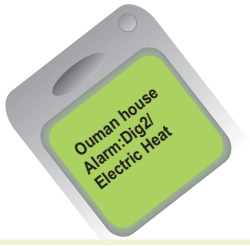
The regulator answers your request by sending the desired information.



Operating the regulator using a GSM:

With the GSM phone you can adjust heating curve settings, user level settings or the regulator's operating mode.
Send the regulator a text message. Using key words, request information about the function whose settings you want to adjust (or obtain the information from your telephone's memory). Adjust the settings in the text message that the regulator sent. Send a text message with the new settings to the regulator. The regulator will make the requested adjustments and acknowledge them by sending back a text message with the new settings.

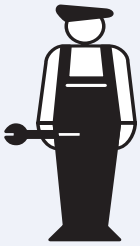
Keywords:	Instruction for adjusting settings
Heating curves	Write the desired supply water temperature in place of the previous setting in the text message "adjust" mode.
H1 Settings	Write the setting in place of the previous setting
H1 Operat.mode	Put a star (*) in front of the operating mode which you want to start using. When you select manual operating, regulator sends information about the supply water temperature and valve positions (0-10Vcontrolled actuators). Attention! When using electric manual control, special caution has to be taken because of danger of freezing and overheating. During the valve flush function, the regulator first opens and then closes the valve. After this automatic regulation continues. The purpose of this function is to clean out a plugged up valve.



Acknowledging alarms:

You can acknowledge an alarm with a GSM by sending the same message back to the regulator.

ENTERING THE MAINTEN. MODE

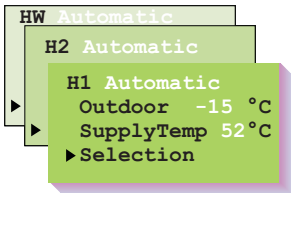


The maintenance person's maintenance guide begins here (p.19 - 44).

Access to the Ouman EH-203/GT maintenance mode is prevented by user rights. Only those persons who have a maintenance code have access to the maintenance mode.

There are typical tuning values and settings in the **maintenance mode** which the maintenance person needs in conjunction with installation. A geothermal heating selection is done in this mode.

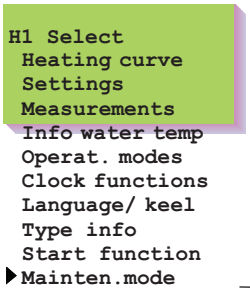
Settings that are not needed as often can be done in the **special maintenance mode**, for ex., restoring original factory settings, special settings, measurements 6 and 11 settings, digital input settings, LON and bus settings as well as modem settings and text message settings.



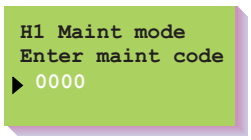
ENTERING THE MAINTENANCE MODE:

Press **ESC** until the display no longer changes.
You are then in the "Selection" display shown in the adjoining picture.

Press the button to move from one regulating circuit to the next (H1, H2, HW).

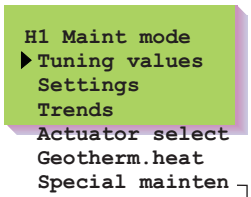


Press the button to move the cursor to "Mainten. mode".
Press **OK.**



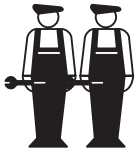
Press **OK.**
Press the **-** or **+** button to set the correct maintenance code one number at a time and press **OK** after each number.

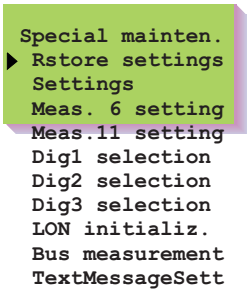
MAINTENANCE MODE:



Press the button to choose what you want to access from the adjoining menu. Each item is presented individually on a separate page.

SPECIAL MAINTENANCE MODE:





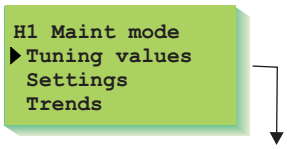
TUNING VALUES

203GT has three PID regulators. The tuning values may have to be adjusted, for example, when the geothermal heating is installed if the setting wavers with the original factory setting.

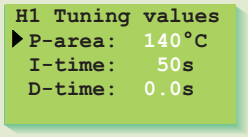
Anticipate and quick run can be set in the HW regulating circuit in addition to PID.

Directions for entering the maintenance mode are on page 19.

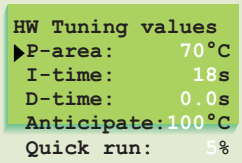
Tuning takes place in the following manner:



The cursor is at "Tuning values". Press **OK.**



Press the button to move the cursor. Press **OK.**
Press the **-** or **+** button to make changes. Press **OK** to confirm.



Press the button to move from one regulating circuit to the next.

INFORMATION ABOUT TUNING VALUES

Settings:	Factory settings:	Range:	Explanation:	Attention!
P-area	H1, H2: 140°C	10...300 °C	Supply water temperature change at which the actuator runs the valve at 100%.	Eg. If the supply water temperature changes 10°C and the P area is 100 °C the position of the actuator changes 10%.
P-area	HW: 70 °C	10...300 °C		
I-time	H1, H2: 50 s	5...300 s	The deviation in the supply water temperature from the set value is corrected by P amount in I time.	
I-time	HW: 18 s	5...300 s		
D-time	H1, H2: 0.0 s	0.0...10.0 s	Regulation reaction speed up in the event of a temperature change	Beware of constant waver!
D-time	HW: 0.0 s	0.0...10.0 s		
Anticipate	HW: 100 °C	50...250 °C	Uses anticipate sensor measurement information to speed up regulation when HW consumption changes.	Increase the anticipate value to decrease reaction to changes in consumption.
Quick run	HW: 5 %	0...100 %	Functions during consumption changes.	Decrease this value to decrease reaction to quick temperature changes.

The original factory settings may vary from the above. Shorten the I time (to approx. 12 seconds) in the HW 3-way mixer.

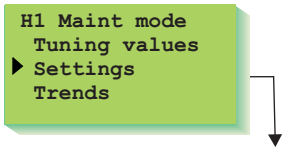
SETTINGS

203GT has three types of settings:

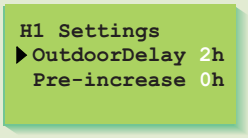
a) **user level settings** which the user can adjust (p. 6-8)
b) **maintenance mode settings** which the maintenance person may have to adjust
c) **special maintenance mode settings** which seldom have to be adjusted (p. 30)

Directions for entering the maintenance mode are on page 19.

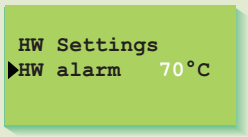
The original factory settings are restored in special maintenance (p. 29)



Press the button to move the cursor to "Settings". Press **OK.**



Press the button to move the cursor to the setting whose value you want to change. Press **OK.**
Press the **-** or **+** button to change the setting. Press **OK.**



Press the button to move to the HW regulating circuit

Press the button to move the cursor to the setting whose value you want to change. Press **OK.**
Press the **-** or **+** button to change the setting. Press **OK.**

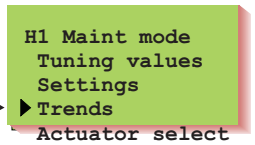
INFORMATION ABOUT MAINTENANCE MODE SETTINGS:

Settings:	Factory settings:	Range:	Explanation:	Attention!
Outdoor temperature delay	H1: 2 h H2: 0 h	0...20h 0...20h	The length of the outdoor temperature measurement follow-up period from which the regulator calculates the average. Supply water regulation and pump control occur on the basis of the measurement of the average.	
Pre-increase	H1: 0 h H2: 0 h	0...5h 0...5h	The duration of the automatic pre-increase after the reduced operation mode.	
HW alarm	70 °C	65...120°C	Domestic hot water alarm limit.	The alarm limit automatically rises during an increase in HW.

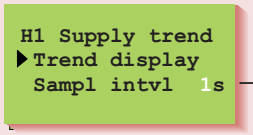
TRENDS

Directions for entering the maintenance mode are on page 19.

It is possible to follow supply water temperature changes on the trend display with the graphic depictor. You can decide yourself how often the temperature is measured. The factory set sampling interval is 1 second.

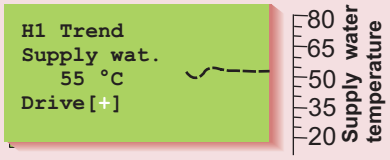


Press the button to move the cursor to “Trends”. Press **OK.**

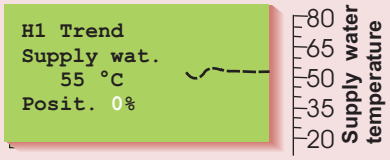


If you want to see the supply water temperature depictor, press **OK.**

You can read supply water temperature changes graphically.
A supply water temperature scale is printed on the right edge of the display. The exact temperature of the supply water also appears as a numerical value.



If a 3-point actuator is being used, the direction the actuator is being run can be seen on the display. The + character indicates that the actuator is being run into an open position. The - character indicates that the actuator is being run into a closed position.

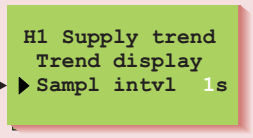


If a voltage controlled actuator (0...10V or 2...10V) is being used, the actuator's position information can be seen on the display. (0% = closed, 100% = open).

By pressing the group select button, you can inspect other regulating circuit's supply water temperature as a trend display.

Exit with **ESC.**

If you want to change the sampling interval, press the button to move the cursor to "Sampl intvl".
Press **OK.**
The time blinks. Press the **-** or **+** button to set the time.
Press **OK.**

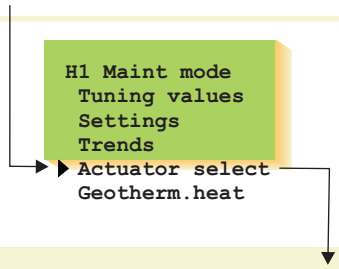


ACTUATOR SELECTION

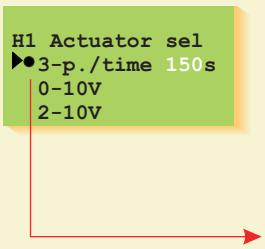
The control mode for each regulating circuit actuator is selected in actuator selection. Options are either 24 VAC 3-point control or DC voltage control (0...10V or 2...10V).

Directions for entering the maintenance mode are on page 19.

Regulating circuit H1 actuator's control output is M1.
Regulating circuit H2 actuator's control output is M2.
Regulating circuit HW actuator's control output is M3.



Press the button to move the cursor to “Actuator select”. Press **OK.**



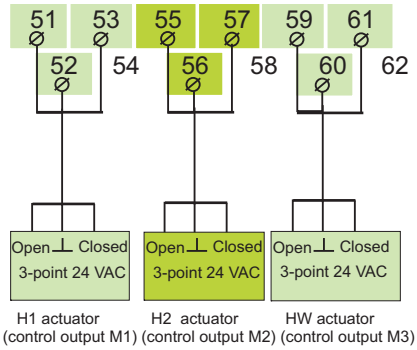
Press the button to move the cursor to the actuator control mode that you want to use. Press **OK.**

If you select the 3-point control mode, the regulator asks for the actuator's running time. The running time indicates how many seconds go by if the actuator drives a valve nonstop from a closed position to an open position. Press the **-** or **+** button to set the time. Press **OK.**
The ● character indicates which control mode is being used.

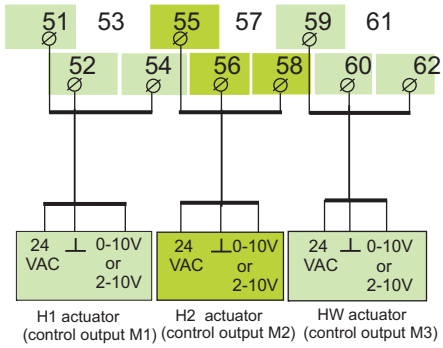
The button moves you from one regulating circuit to the next.

VALVE ACTUATOR CONNECTION:

3-point controlled actuator (24VAC)

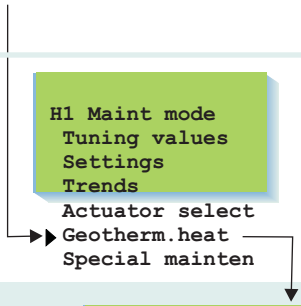


0...10V or 2...10V DC controlled actuator (24VAC)

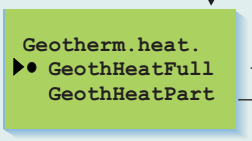


GEOTHERMAL HEATING

Select full effect or limited effect geothermal heating. After this selection you can change the settings that switch the compressor and electrical heating resistor on and off.
Relay 1 controls the geothermal heating unit's electrical heating resistor and relay 2 controls the running of the geothermal heating unit's compressor.

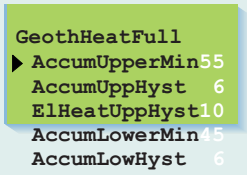


Press the button to move cursor to "Geotherm.heat".
Press **OK.**



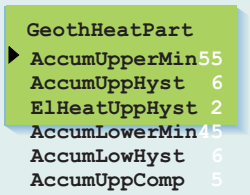
Press the button to move cursor to "GeothHeatFull" or "GeothHeatPart".
Press **OK.** The ● character indicates which one is being used.

The controller controls the compressor and electrical heating resistor according to both the values set here and the controller indicated H1 circuit supply water temperature. The controller indicated supply water temperature is found in the controller's supply water info.



Full effect geothermal heating:

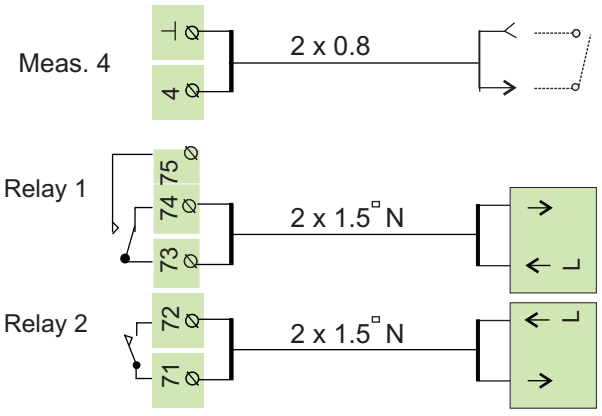
The compressor and the electrical heating resistor cannot be on at the same time.
Additional information about full effect geothermal heating on pages 25 and 26.



Limited effect geothermal heating (=part effect):

The compressor and the electrical heating resistor can be on at the same time.
Additional information about partial effect geothermal heating on pages 27 and 28.

Connection guide:



Compressor running information.

When relay is inactive, the electrical heating resistor is switched on and strip connector 73 - 74 is closed.
When relay is active, the electrical heating resistor is switched off and strip connector 73 - 74 is open.

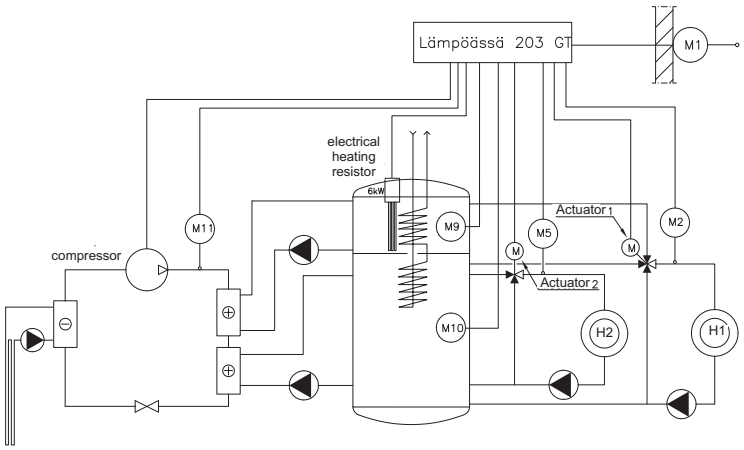
When relay is active, the compressor is switched on. When the regulator is without electricity , compressor can not be able to switch on. (strip connector 71-72 is open).

Full effect geothermal heating

There are two heating circuits (H1 and H2) and one domestic hot water regulating circuit (HW) in the203GT.

Relay 1 Geothermal heating unit's electrical heating resistor control. When relay is inactive, the electrical heating resistor is switched on (strip connector 73-74 is closed).

Relay 2 geothermal heating unit's compressor control. When the relay is active, the compressor is switched on (strip connector71-72 is closed).



Measurement 4: Compressor's running information
Measurement 1: Outdoor temperature
Measurement 2: H1 Supply water temperature
Measurement 9: Accumulator upper part temperatur
Measurement 10: Accumulator lower part temperatur
Measurement 11: Hot gas temperature

Settings:	Factory settings:	Range:	Explantion:
AccumUpperMin	55 °C	5... 55 °C	Temperature control setting for the accumulator's upper part
AccumUpperHys	6 °C	3... 10 °C	Temperature control hysteresis for the accumulator's upper part
ElHeatUppHyst	10 °C	2... 10 °C	Additional hysteresis for electrical heating resistor control
AccumLowerMin	45 °C	30... 55 °C	Minimum temperature for the accumulator's lower part
AccumLowerHys	6 °C	3... 10 °C	Temperature control hysteresis for the accumulator's lower part

Calculated setting

Maximum limit for the lower part

The maximum limit varies from 53° C to 55° C:
- When the outdoor temperature is above +15°C, the maximum limit is 53° C.
- When the outdoor temperature is below -5° C, the maximum limit is 55 ° C.
- When the outdoor temperature is from +15° C to -5° C the temperature limit changes linearly from 53° C to 55° C.

Function and its terms:

A compressor running command is given (relay 2 is active, strip connector space 71-72 closes), when
- the temperat. of the accumulator's upper part (meas. 9) drops below the [*"AccumUpperMin"* **-** (*"AccumUppHyst"* / 2)] **or**
- the temperature of the accumulator's lower part (meas. 10) drops below [*controller indicated H1 supply water temperature* **+** 5° C **-** *"AccumLowHyst"*] **or**
- the temperature of the accumulator's lower part (meas. 10) drops below the *"AccumLowerMin"* setting.

The compressor stops running (relay 2 is inactive, strip connector space 71-72 opens), when
- the temperat. of the accumulator's upper part (meas. 9) rises above the [*"AccumUpperMin"* **+** (*"AccumUppHyst" / 2*)] **and**
- the temp. of the accumulator's lower part (meas. 10) rises above the [*controller indicated H1 supply water temp* **+** 5°C] **and**
- the temperature of the controller's lower part (meas. 10) rises above the ["*AccumLowMin*" **+** *"AccumLowHyst"*] temperature.

Compressor running is inhibited (the compressor will not run)
-if less than 5 minutes has lapsed since the previous running period
-if the hot gas temperature measurement (meas. 11) is connected and the temperature of the hot gas rises above 120°C (the compressor starts running when the temperature drops to 117° C).
-if the temp. of the accumulator's upper part (meas. 9) exceeds 95° C (the compressor starts running when the temperature has dropped to 85° C)
-if the temperature of the accumulator's lower part exceeds the calculated "Lower part maximum limit" (53...55°C). The compressor starts up when the temperature of the accumulator's lower part has dropped 3° C below the calculated "Lower part maximum limit")
-if the electrical heating resistor has been switched on

The electrical heating resistor switches on if
1. Compressor control has been on for an hour and the temperat. of the accumulator's lower part has not risen a degree **or** the compressor alarm is active and an attempt has been made to restart the compressor after a delay time of 5 minutes **and**
2.The temperature of the compressor's upper part is below [*"AccumUppMin"* **-** (*"AccumUppHyst"* / 2) **-** "*El.HeatUppHyst*"] **or** the temp. of the accumulator's upper part (meas. 9) is below the [*controller indicated H1 supply water temp.* **-** **"***El.HeatUppHyst"*] (This calculation takes into account that the temperature of the controller indicated H1 supply water temperature is a maximum of 50° C.)
The electrical heating resistor switches off (relay 1 is active, strip connector space 73-74 opens), when
- the temperature of the accumulator's upper part (meas. 9) rises above the ["*AccumUpperMin*" **-** (*"AccumUppHyst"* / 2)] **and**
- the temperature of the controller's upper part is above the [*controller indicated H1 supply water temp*]

The hour delay for electrical heating resistor start up is reactivated when measurement 4 receives running information from the compressor
Electrical heating resistor control always stops
-if the temperature of measurement 9 rises above 95° C; the temp. must drop to 85° C before the electrical heating element can start up

Alarms:

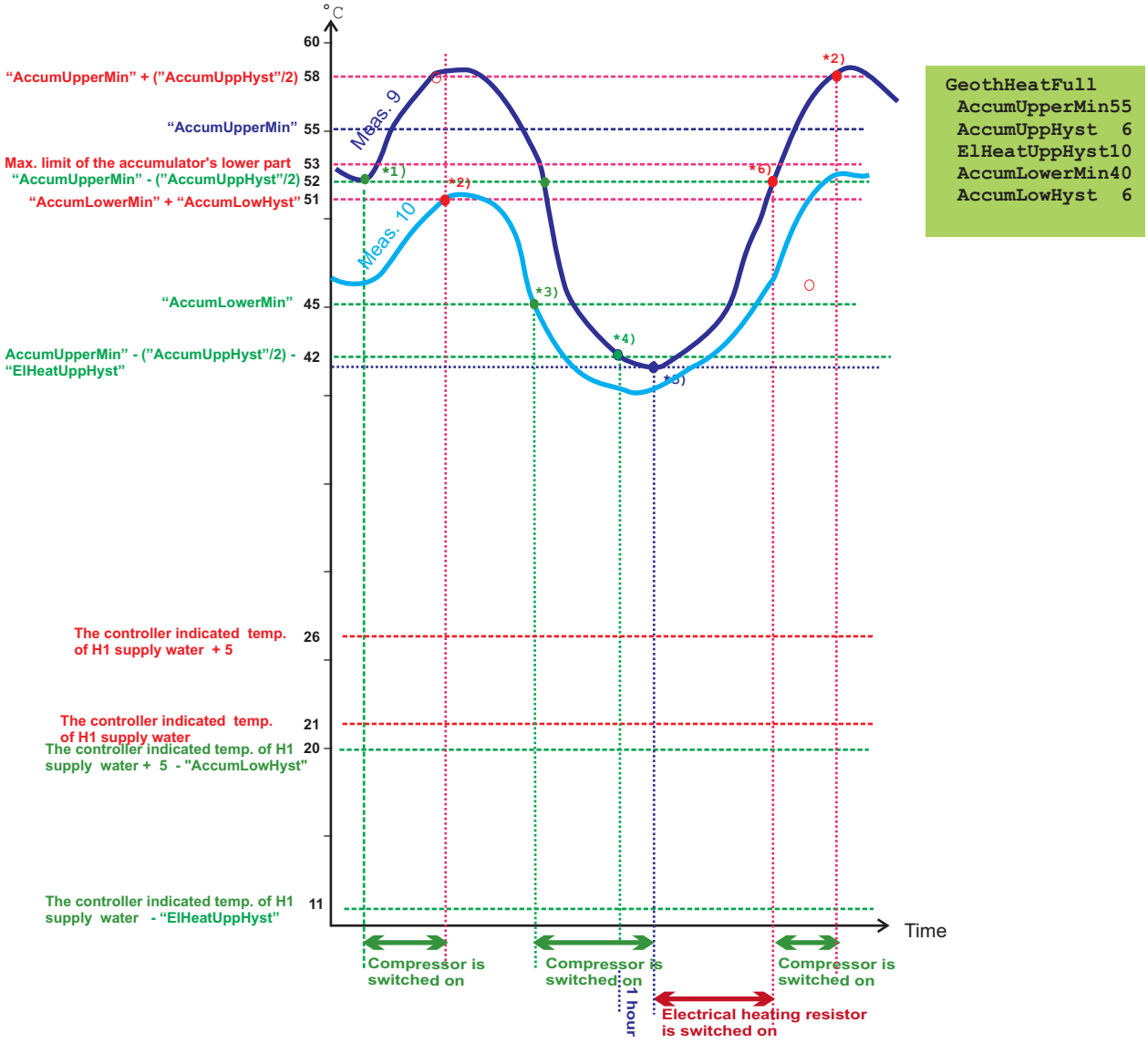
The ”Electric heat” alarm goes off when the electrical heating resistor switches on (10s delay) .
Measurement 4: If the controller has given the compressor a running permit but measurements does not receive running information, a ”CompressorRun” deviation alarm is given and the controller deletes the compressor's running permit. The compressor tries to restart after 5 minutes and after that at 60 minute intervals if the electrical heating resistor is not on. If the compressor starts up, it has to remain running for at least 2 minutes so the compressor alarm is deleted. An alarm can be caused by:
- the overcurrent protection of the overpressure pressostat, compressor or geothermal heating pump (acknowledged by the electricity distribution cabinets) or
- the low pressure pressostate (acknowledged by the pressostat).

Measurement 9: the temp of the accumulator's upper part exceeds 95°C, an “Overheat” alarm is given; (the alarm disappears when the temperature drops below 85°C)

Attention! The compressor and the heating resistor cannot be on at the same time!

An example of automatic control:

Geothermal heating unit control using factory settings. The outdoor temperature at the time of inspection is +20° C and the controller indicated supply water temperature is 21° C.



1) Measurement 9 gives the compressor a running command because the temperature of measurement 9 is below [“AccumUpperMin”* **-** (*“AccumUppHyst”/2*)]

2) The compressor stops running because the temperature of measurement 9 is above the [“AccumUpperMin”* **+** (*”AccumUppHyst”/2*] setting **and** the temperature of measurement 10 is above the [*controller indicated H1 supply water temp* +5] **and** above [*“AccumLowMin* **+** *AccumLowHyst*”]

*3) Measurement 10 gives the compressor a running command because the temperature of measurement 10 is below *“AccumLowMin”*

4) The electrical heating resistor can switch on after an hour because the temperature of measurement 9 is below the [”AccumUpperMin”* **-** (*“AccumUppHyst”*/2) **-** *”ElHeatUppHyst”*] temperature

*5) The compressor switches off and the electrical heating resistor switches on because the conditions for the electrical heating resistor to be on are met and during an hour's time the temperature of measurement 10 has not risen 1° C while the compressor has been running.

*6) The electrical heating resistor is switched off because the temperature of measurement 9 is above the [”*AccumUpperMin*” **-** (*“AccumUppHyst”* / 2)] setting and above the [*controller indicated H1 supply water temp* **+** 5]

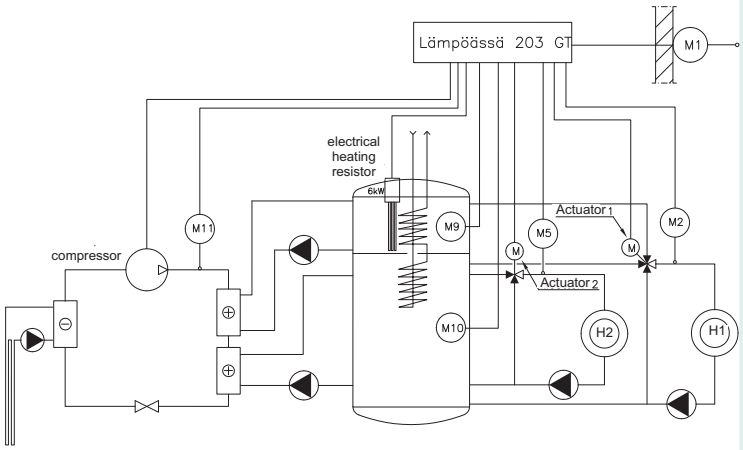
Limited effect geothermal heating

There are two heating circuits (H1 and H2) and one domestic hot water regulating circuit (HW) in the 203GT.

Relay 1 Geothermal heating unit's electrical heating resistor control. When relay is inactive, the electrical heating resistor is switched on (strip connector 73-74 is closed).

Relay 2 geothermal heating unit's compressor control. When the relay is active, the compressor is switched on (strip connector71-72 is closed).

Measurement 1: Outdoor temperature
Measurement 2: H1 Supply water temperature
Measurement 4: Compressor's running information
Measurement 9: Accumulator upper part temperatur
Measurement 10: Accumulator lower part temperatur
Measurement 11: Hot gas temperature



Settings:	Factory settings:	Range:	Explantion:
AccumUpperMin	55 °C	5... 80 °C	Minimum temperature of accumulator's upper part
AccumUppHyst	6 °C	3... 10 °C	Temperature control hysteresis of accumulator's upper part
ElHeatUppHyst	2 °C	2... 10 °C	Additional hysteresis for electrical heating resistor control
AccumLowerMin	45 °C	30... 55 °C	Minimum temperature of accumulator's lower part
AccumLowHyst	6 °C	3... 10 °C	Temperature control hysteresis of accumulator's lower part
AccumUppComp	5 °C	0... 10 °C	Outdoor compensation of the accumulator's upper part when the outdoor temperature drops to -20° C or below.

Calculated setting

Outdoor compensation: Compensation grows linearly so that it is 0 at an outdoor temp. of + 20° C and reaches the "AccumUppComp" setting at an outdoor temp. of -20° C

Upper part setting: Calculate according to the formula: "AccumUppMin" + Amount of outdoor compensation

Maximum limit for the lower part: The maximum limit varies from 53° C to 55° C:
- When the outdoor temperature is above +15°C, the maximum limit is 53° C.
- When the outdoor temperature is below -5° C, the maximum limit is 55 ° C.
- When the outdoor temperature is from +15° C to -5° C the temperature limit changes linearly from 53° C to 55° C.

Function and its terms:

A compressor running command is given
- when the temp. of the accumulator's upper part (meas. 9) drops below the [*Upper part setting* **-** *"AccumUppHyst"* /2)] **or**
- when the temperature of the accumulator's lower part (meas. 10) drops below the [*controller indicated H1 supply water temp* **+** 5° C **-** *"AccumLowHyst"*] **or**
- when the temperature of the accumulator's lower part is below the "*AccumLowMin*" setting

The compressor stops running (relay 2 is inactive, strip connector space 71-72 opens) when
- the temperature of the accumulator's upper part (meas. 9) rises above the [*Upper setting* **+** (*"AccumUppHyst"* / 2)] temperature **and**
- the temp. of the accumulator's lower part (meas. 10) rises above the [*controller indicated H1 supply water temp* **+** 5°C] **and** the ["*AccumLowMin*"**+** "*AccumLowHyst*"] temperature

Compressor running is inhibited (the compressor does not run)
- if under 5 minutes has lapsed since the last running period
- if the hot gas temp. measurement (meas. 11) is connected and the temp. of the hot gas exceeds 120° C (the compressor can start up when the temperature has dropped to 117° C).
- if the temp. of the accumulator's upper part (meas. 9) exceeds 95° C (the compressor can start up when the temperature has dropped to 85° C)
- if the temperature of the controller's lower part exceeds the calculated "Lower part maximum limit" (53...55°C). The compressor can start up when the temperature of the accumulator's lower part has dropped 3° C below the calculated "Lower part maximum limit".

The electrical heating resistor switches on when
- the temperature of the accumulator's upper part (meas. 9) drops below the [*Upper part setting* **-** (*"AccumUppHyst"* / 2) **-** "El.HeatUppHyst"] temperature **or**
- the temperature of the accumulator's upper part (meas. 9) is below the [*controller indicated H1 supply water temp* **-** "*El.HeatUppHyst*"].

The electrical heating resistor switches off (relay 1 is active, strip connector space 73-74 opens), when
- the temperature of the accumulator's upper part (meas. 9) exceeds the [*Upper part setting* **-** ("*AccumUppHyst*" / 2)] temperature **and**
- the temperature of the accumulator's upper part exceeds the *controller indicated H1 supply water temp*.

Heating with electrical heating resistance is inhibited,
- if the temperature of measurement 9 exceeds 95° C, the temperature must drop to 85° C before the electrical heating resistor can switch on

Alarms:

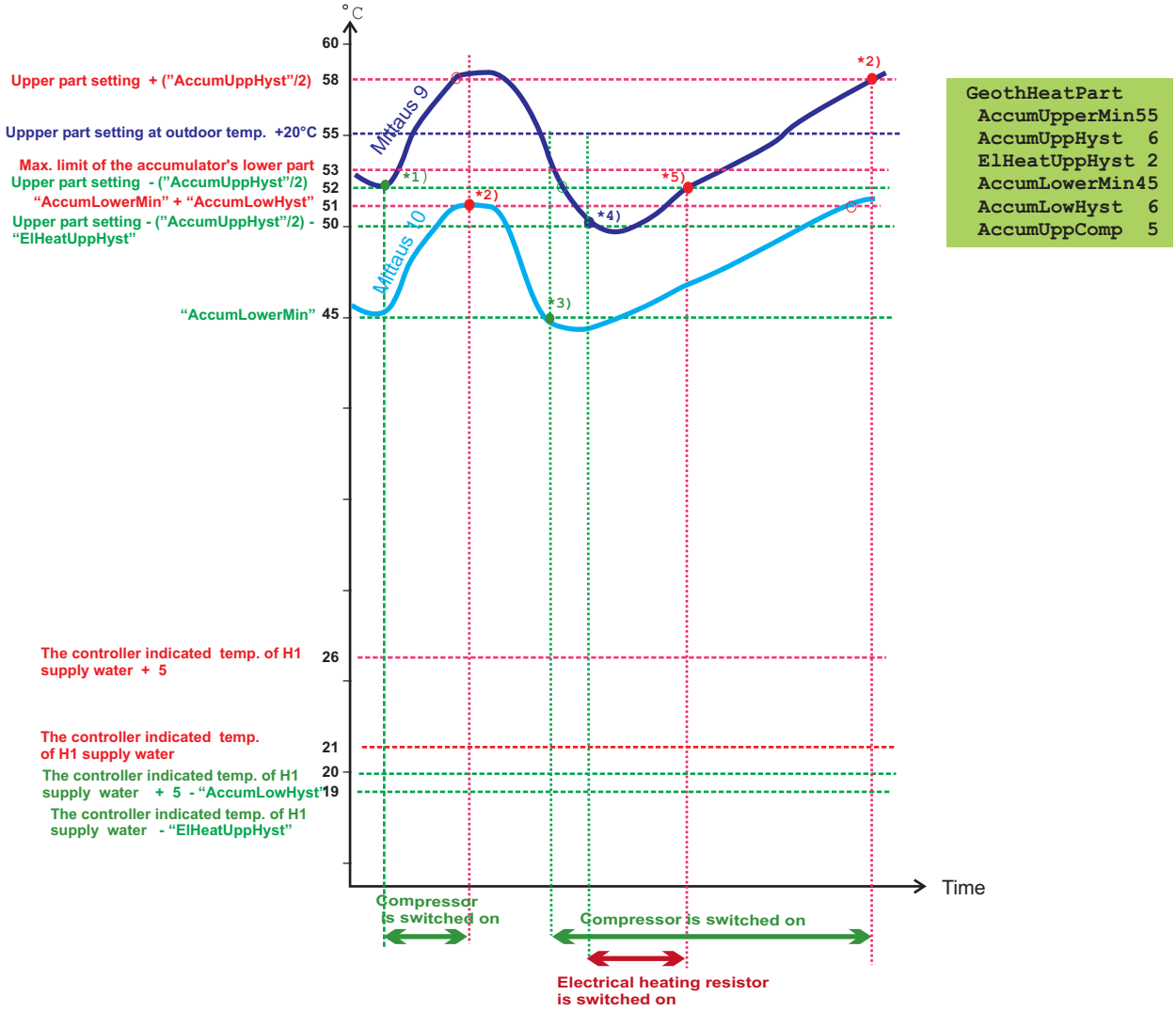
Measurement 4: If the controller has given the compressor a running permit but measurements does not receive running information, a ”CompressorRun” deviation alarm is given and the controller deletes the compressor's running permit. The compressor tries to restart after 5 minutes and after that at 60 minute intervals if the electrical heating resistor is not on. If the compressor starts up, it has to remain running for at least 2 minutes so the compressor alarm is deleted. An alarm can be caused by:
- the overcurrent protection of the overpressure pressostat, compressor or geothermal heating pump (acknowledged by the electricity distribution cabinets) or
- the low pressure pressostate (acknowledged by the pressostat).

Measurement 9: the temp of the accumulator's upper part exceeds 95°C, an “Overheat” alarm is given; (the alarm disappears when the temperature drops below 85°C)

Note! With partial effect geothermal heating the electrical heating resistor can be switched on when the compressor is running

An example of automatic control:

Geothermal heating unit control using factory settings. The outdoor temperature at the time of inspection is +20° C and the controller indicated supply water temperature is 21° C.


°C
60
Upper part setting + (”AccumUppHyst”/2) 58
Uppper part setting at outdoor temp. +20°C 55
Max. limit of the accumulator's lower part 53
Upper part setting - (”AccumUppHyst”/2) 52
“AccumLowerMin” + “AccumLowHyst” 51
Upper part setting - (”AccumUppHyst”/2) - “ElHeatUppHyst” 50
“AccumLowerMin” 45
The controller indicated temp. of H1 supply water + 5 26
The controller indicated temp. of H1 supply water 21
The controller indicated temp. of H1 supply water + 5 - “AccumLowHyst” 20
The controller indicated temp. of H1 supply water - “ElHeatUppHyst” 19
Mittaus 9
Mittaus 10
*1)
*2)
*3)
*4)
*5)
Time
Compressor is switched on
Compressor is switched on
Electrical heating resistor is switched on
GeothHeatPart
AccumUpperMin55
AccumUppHyst 6
ElHeatUppHyst 2
AccumLowerMin45
AccumLowHyst 6
AccumUppComp 5

*1) Measurement 9 gives the compressor a running command because the temperature of meas. 9 is below the [Upper part setting **-** (”*AccumUppHyst* "/ 2)

*2) The compressor stops running, because the temperature of meas. 9 is above the [“*Upper part setting*" **+** (“*AccumUppHyst*”/2)] setting **and** the temperature of measurement 10 is above the [*controller indicated H1 supply water temp* **+** 5] **and** above [“*AccumLowMin*” **+** “*AccumLowHyst*”]

*3) Measurement 10 gives the compressor a running command because the temperature of measurement 10 is below “*AccumLowMin*”

*4) The electrical heating resistor switch on because the temperature of measurement 9 is below the [*Upper part setting* **-** (“*AccumUppHyst*” / 2) **-** “*El.HeatUppHyst*” temperature

*5) The electrical heating resistor switches off because the temperature of measurement 9 is above the [*Upper part setting* **-** (“AccumUppHyst "/ 2)] setting **and** above the [*controller indicated H1 supply water temp* **+** 5] setting

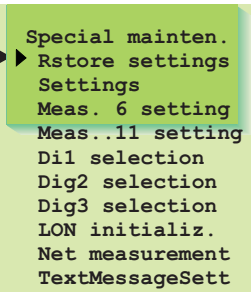
RESTORING SETTING

Restoring settings:

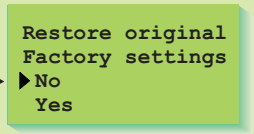
1. The regul. restores factory settings to the charasteristic heating curve settings.
2. Eliminates clock functions
3. Restores user and maintenance level settings
4. Selects automatic control for the operating mode
5. Selects the basic regulator for the regulator type.
6. Identifies the connected sensors and assumes which regulating circuits are in use.
7. Restores factory settings to the tuning values and trend sampling intervals.
8. Selects the 3-point control for actuator control which has a running time of 150s in the H1 and H2 regul. circuits and the 0...10V control for actuator control which has a running time of 15s in the HW regul. circuit.
9. Selects full effect geothermal heating
10. Sets “ElectricHeat” as an assumption into digital input 2 and “Alarm Dig 1(3)” as an assumption into digital inputs 1 and 3.
11. Measurements are not read from the net.
12. Erases the telephone number and restores the factory settings to the modem settings.

Original factory settings can be restored with the regulator in the following manner:

Directions for entering the maintenance mode are on page 19.



Press the button to move the cursor to "Special mainten.".
Press **OK.**
The cursor is at "Rstore settings". Press **OK.**

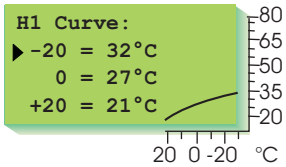


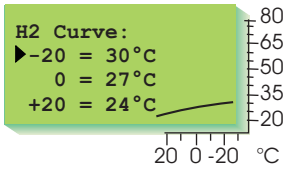
Restore original factory settings:

Press the button to move the cursor to "Yes".
Press **OK.**

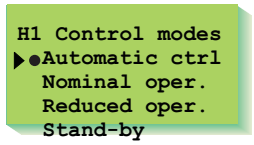
ORIGINAL FACTORY SETTINGS:

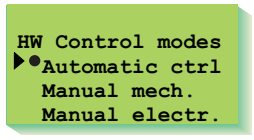
Characteristic heating curve:



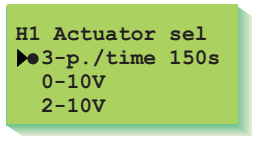


Operating mode:



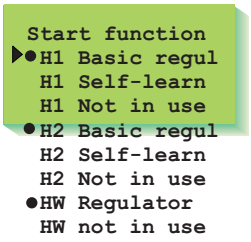


Actuator selection:

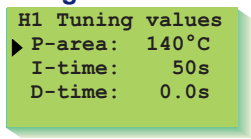


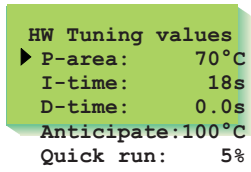
User level settings:	Factory setting:
Room temperature	21.5 °C
Temperature drop (supply water)	0 °C
Min. allowed supply water	15 °C
Max. allowed supply water	45 °C
Room compensation ratio	1.5 °C
Wind compensation ratio	0 °C
Sun compensation ratio	0 °C
Pre-increase	0 °C
Autumn drying	1 °C
Valve close	20 °C
Domestic hot water	55.0°C
Geothermal heating settings:	
Minimum temp of accumulator's upper part	55°C
Hysteresis of accumulator's upper part	6 °C
Additional hysteresis for electrical heating resistor control	10°C
Minimum temp. of accumulator's lower part	45°C
Hysteresis of accumulator's lower part	6 °C
Maintenance level settings:	
Outdoor temp. delay H1/ H2	2 h/ 0 h
Pre-increase	0 h
Domestic hot water alarm	70 °C
Special maintenance settings:	
Room temperature delay	0.5h
H1 Supply water min at 0°C	10°C
H2 Supply water min at 0°C	10°C
H1 Supply water min at -20°C	30°C
H2 Supply water min at -20°C	30°C
The amount of deviation from the setting, which causes the alarm H1/H2/HW	75°C
The duration of the deviation that causes the alarm	60min
Drop in supply water temperature when the exhaust fan is at ½ speed.	6°C
Domestic hot water alarm delay	30s

Start function:



Tuning values:



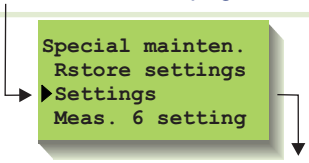


Geothermal heating:

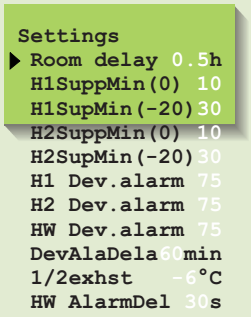
SETTINGS

In the 203GT heating regulator the user can adjust most of the settings (see settings p. 6-8). Some of the settings that control the regulator's functions can be set in the maintenance mode (see page 21) and some in special maintenance. Seldom needed settings can be adjusted in special maintenance.

Directions for entering the maintenance mode are on page 19.



Press the button to move the cursor to "Settings". Press **OK.**



Press the button to move the cursor to the parameter that you want to change. Press **OK.**

Press the **-** or **+** button to change the setting. Press **OK.**

INFORMATION ABOUT SPECIAL MAINTENANCE SETTINGS:

Settings:	Factory settings:	Range:	Explanation:	Attention!
Room delay	0.5h	0...2	The average inside temperature measurement time which the room compensation uses.	
H1 SuppMin (0°C) H2 SuppMin (0°C)	10°C 10°C	5...20 5...20	Lower limit of supply water during a free temperature drop in the regulating circuits H1/H2 when the outdoor temperature is 0°C. (stand-by function)	
H1 SupMin(-20°C) H2 SupMin(-20°C)	30°C 30°C	10...50 10...50	Lower limit of supply water during a free temperature drop in the regulating circuits H1/H2 when the outdoor temperature is -20°C. (stand-by function)	
H1 Dev. alarm H2 Dev. alarm HW Dev. alarm	75°C 75°C 75°C	1...75 1...75 1...75	H1/H2/HW supply water temperature deviation from the setting determined by the regulator which causes the alarm	
DevAlaDela	60 min	0...90	The alarm goes off if the deviation has lasted for the set time.	
½ exhst	-6°C	0...-10	Drop in supply water temperature when the exhaust fan is at ½ speed.	Only H1
HW AlarmDel	30s	0...120	The length of time from which the regulator calculates the HW average temperature for the alarm.	

MEASUREMENT 6 SETTING

In this special maintenance mode, measurement 6 can be changed from just a free temperature measurement to a regulating circuit H2 room compensation measurement or a regulating circuit H1 and H2 wind or sun compensation measurement. Free temperature measurement is a factory setting which is labeled "Measure 6". This label can be changed **using the text editor.**

Directions for entering the maintenance mode are on page 19.

```
Special mainten.
 Rstore settings
 Settings
▶Meas. 6 setting
 Meas.11 setting
```

Press the button to move the cursor to "Meas. 6 setting". Press **OK.**

Selecting measurement 6:

Press the button to move the cursor to what you want to connect to measurement 6. Press **OK.**

The ● character indicates which measurement has been chosen for measurement 6.

```
 Meas. 6 setting
▶● Measure 6
   H2 Room temp
   Wind meas.
   Sun meas.
   Not connected
```

Labeling measurement 6 using the text editor:

```
 Name change
▶Measure 6
 Give new label
```

The factory setting for measurement 6 is "Measure 6".
Relabeling is shown on page 9.

Setting limits for the wind or sun sensor measurement message:

You must set compensation limits for wind or sun measurements. The minimum indicates where in the transmitter's measurement area the compensation begins and the maximum indicates at which measurement area the compensation is at maximum value.

More information about sun and wind sensor connection on the next page

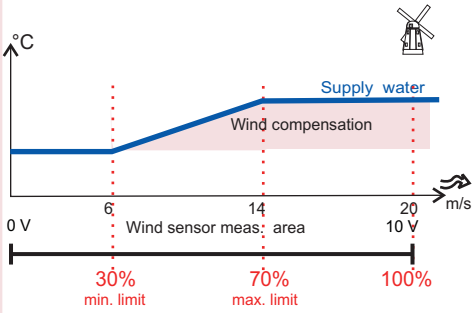
```
Comp/Meas. data
▶Min /   0%
 Max /  100%
```

Press **OK.**
Press the **-** or **+** button to set a limit and press **OK** to confirm.

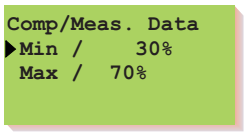
Measurement 6: Wind/ Sun meas

When you connect the wind or sun sensor to measurement 6, you instruct the regulator when you want the wind or sun compensation to function. Calculate compensation limits (min/max) in the same way regardless of which sensor is in use.
The wind and sun compensation ratio indicates how many degrees compensation changes the supply water temperature and the user can set this. (See settings p. 8).
The wind and sun sensor measurement signal can be 0...10 V, 2...10 V, 0...20mA or 4...20 mA. Adjust the sensors with the regulator's resistors so that the measurement message that comes from the regulator is always 0...5 V.

Compensation area calculation



Picture. Wind compensated supply water temperature curve.



Example: A wind sensor is in use which has a measurement area of 0...20 m/s. You want wind compensation to begin when the wind velocity is 6 m/s (min. limit) and compensation to be at maximum value when the wind velocity is at least 14 m/s (max. limit). Calculate how many percent the wind compensation limits (min. limit and max. limit) are from the measurement area's maximum (=20 m/s), and set them as the minimum and maximum compensation percentages.

$$\text{Min. compens.} = \frac{\text{Min. limit (m/s)}}{\text{meas. area's max.}} \times 100\% = \frac{6\ \text{m/s}}{20\ \text{m/s}} \times 100\% = 30\%$$

$$\text{Max.compens.} = \frac{\text{Max. limit (m/s)}}{\text{meas. area`s max.}} \times 100\% = \frac{14\ \text{m/s}}{20\ \text{m/s}} \times 100\% = 70\%$$

If measurement sensors that begin from zero are in use, (0...10V or 0...20mA) set the values calculated with the above formula as the minimum and maximum compensation percentages.

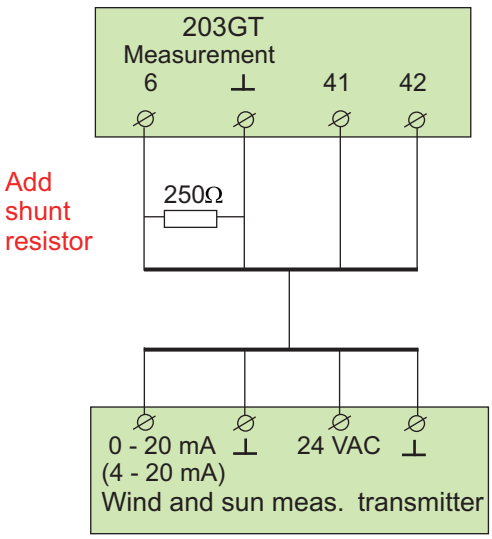
Setting the minimum and maximum compens. when the sensor's measurement area does not begin at zero.

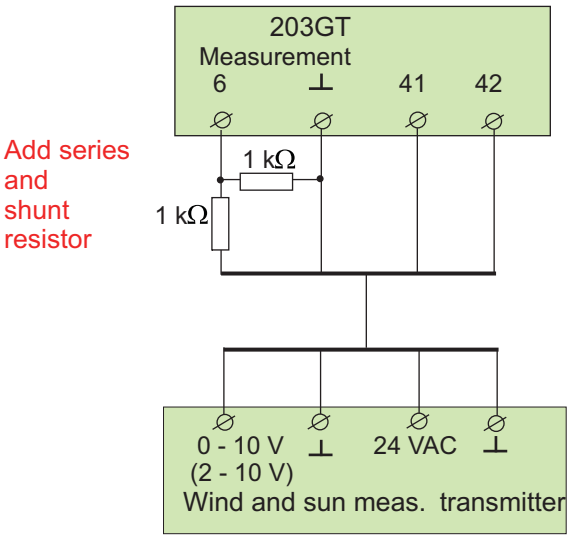
Value obtained from the formula	2-10V 4 -20 mA
10 %	→ 28 %
20 %	→ 36 %
30 %	→ 44 %
40 %	→ 52 %
50 %	→ 60 %
60 %	→ 68 %
70 %	→ 76 %
80 %	→ 84 %
90 %	→ 92 %
100 %	→ 100 %

1. Calculate the compensation percentages with the "min. compens." and "max. compens." formula.

2. See which values should be set for the regulator from the equivalency table.

Wind or sun sensor connection:

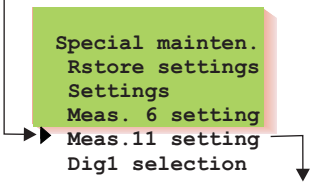




MEASUREMENT 11 SETTING

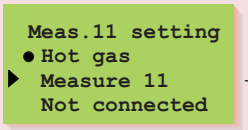
The value of measurement 11 can be changed in this special maintenance mode. ”Hot gas” is a factory setting.

Directions for entering the maintenance mode are on page 19.



Press the button to move the cursor to "Meas. 11 setting". Press **OK.**

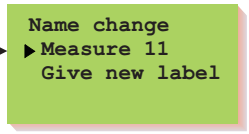
Selecting measurement 11:



Press the button to move the cursor to what you want to connect to measurement 6. Press **OK.**

The ● character indicates which measurement has been chosen for measurement 6.

Labeling measurement 6 using the text editor:



The factory setting for measurement 6 is "Hot gas" -measurement.
Relabeling is shown on page 9.

Hot gas temperature:

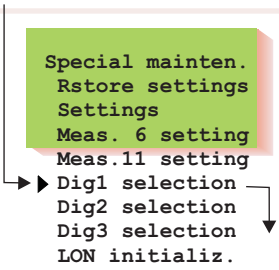
If the hot gas temperature exceeds 125°C the compressor cannot start up.

DIGITAL INPUTS

203GT has three digital inputs. A digital input can be connected to contact information or pulse information. Contact information can be used to receive an alarm. Alarms can be labelled using the text editor according to their cause. Alarms can be transferred to, e.g., A GSM phone as text messages.

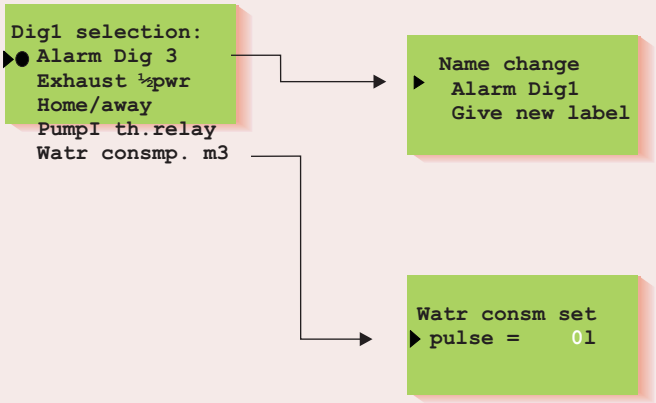
Pulse information can be read, e.g., from a district heating energy meter or water meter.

Directions for entering the maintenance mode are on page 19.



Press the button to move the cursor to"Dig 1, Dig 2 or Dig 3 selection". Press **OK.**

Press the button to move the cursor to indicate which information has been connected to the Dig channel in question. Press **OK.** The ● character indicates the selection made.

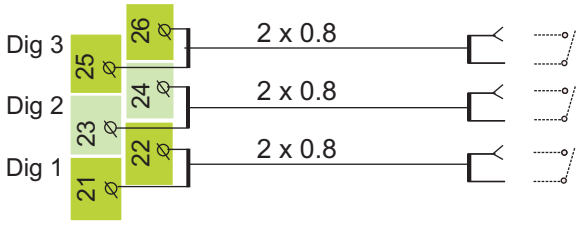


Alarm use: Alarm switch information. When the switch is closed, an alarm goes off. You can use the text editor to label the alarm, e.g., wastewatertank! (see p. 9). In the event of an alarm, the regulator sounds the alarm and indicates on the display from which digital input the alarm came from. Transferring the alarm to a GSM phone (see p. 37 - 38).

Pulse information from the facility's water meter: Press **OK**. Set the number of liters equivalent to one pulse and press **OK**. The facility's water consumption (Water m3) can be seen on the regulator's measurements display.

On the display:	Explanation:
Alarm Dig1(3)	Alarm switch information. When the switch is closed, an alarm goes off.
Exhaust ½pwr	Exhaust fan ½ speed information. When the switch is closed the exhaust fan is at ½ speed. The information is used to lower the heat when the exhaust fan is at ½ speed. The amount of the drop is given in special maintenance settings. (see p. 30, ½ exhst)
Home/away	Away switch information. (switch closed, H1/H2 reduced temperature mode is on).
PumpI th.relay	Pump 1 thermal relay switch information. When the switch is closed pump 1 does not run. In that case regulator gives an alarm.
Watr consmp. m3	Pulse information from the facility's water meter

Connection guide:



Pulse information (switch information)

Contact information about the heating resistor switching on

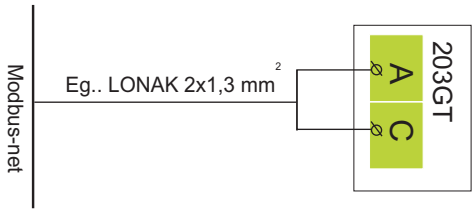
Geothermal heating unit selector switch information (automat/start up)

NET CONNECTIONS/ LON initialization

203GT controller can be connected to the MODBUS, RS-485 or LON bus. When the EH-203/GT controller is connected to the bus, a (Modbus-200, EH-485, or LON-200 card) bus adapter card (optional equipment) is installed. Detailed instructions for installing and initializing the bus adapter card are provided.

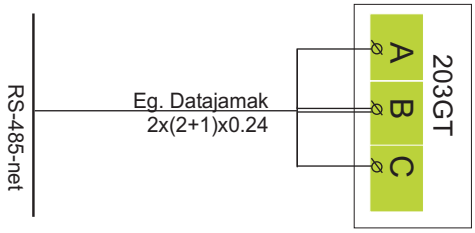
When connecting the controller to the LON-field bus, LON-bus initialization occurs in the controller's special maintenance mode. Other buses do not have to be initialized from the controller.

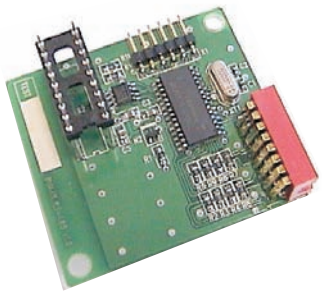
Connect the 203GT to a MODBUS field bus:



MODBUS-200-adapter card

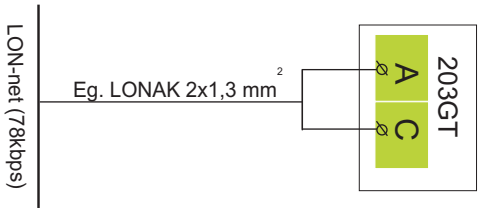
Connect the 203GT to a RS-485 field bus:



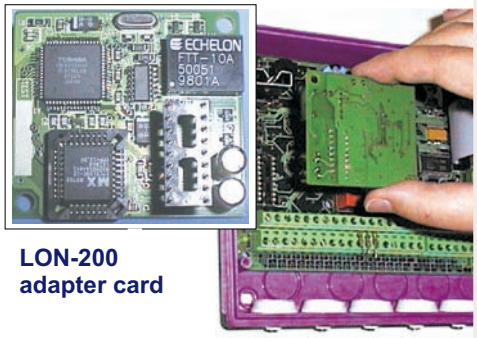


EH-485-adapter card

Connect the 203GT to a LON field bus:



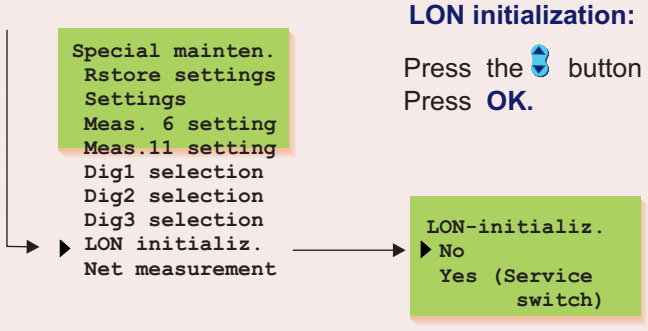
When using an LON bus connect the protective ground of the 230VAC supply current to strip connector 81 of the controller!



LON-200 adapter card

Directions for entering the maintenance mode are on page 19.

LON initialization:



Press the button to move the cursor to"LON initializ.".
Press **OK.**

In this special maintenance mode you can control the Neuron processor's service pin which is on the LON-200 card so that the Neuron sends the bus its own identification (48 bit Neuron ID). This procedure is necessary when initializing 203GT + LON-200 into the facility's LON net .

NET MEASUREMENT

203GT has an LON-200, RS-485 and MODBUS-200 bus adapter cards as an optional equipment.
In this special maintenance mode you can select which measurement informati is to be read from the net. If you selected to read wind or sun measurements from the net, you must set the compensation area in this mode.

Directions for entering the maintenance mode are on page 19.

```
Special mainten.
 Rstore settings
 Settings
 Meas. 6 setting
 Meas.11 setting
 Dig1 selection
 Dig2 selection
 Dig3 selection
 LON initializ.
▶Net measurement
 TextMessageSett.
```

Press the ↕ button to move the cursor to “Net measurement”.
Press **OK.**

Browsing the net measurements:

```
 Net measurement
▶● Outdr tmp meas
   H1 Room meas.
   H2 Room meas.
 ● Wind measurem.
 ● Sun measurem.
   Watr consm. m3
```

By using the ↕ button to browse, you can see which measurements can be read from the net.

Setting net measurements:

```
Outdr tmp meas
▶● No net
   Yes net
```

Move the cursor to the measurement you want and press **OK.**
If you want to select an serial interface for the measurement in question, move the cursor to Yes net and press **OK.** The ● character indicates that the measurement information is read from the net.

Setting wind or sun measurements (net):

You must set the compensation limits for wind and sun measurements. The minimum indicates when compensation begins and the maximum indicates when compensation is at a maximum value. Set the limits for wind measurement as wind speed (m/s) and for sun measurement as amount of light (lx).

```
Comp/Meas. data
▶Min/     0.0m/s
 Max/    10.0m/s
```

Setting limits:
Press **OK.**
Press the **-** or **+** button to set the limit and confirm by pressing **OK.**

```
Comp/ Meas. data
▶Min/        0 lx
 Max/     9000 lx
```

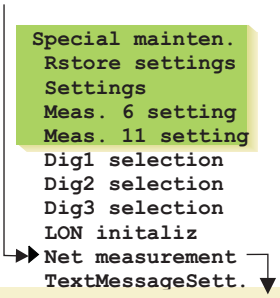
Attention! Set wind and sun compensation in "Settings" (see page 8).

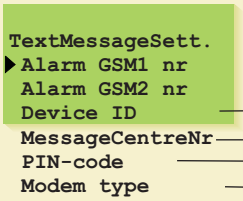
MODEM SETTING (TEXT MESSAGE CONNECTION)

Directions for entering the maintenance mode are on page 19.

In order to communicate via text messages, the controller must be connected to a GSM modem (optional equipment). The modem comes with an adapter cable equipped with D-connector that is used to connect the Modem to the controller. The controller's strip connector B-D space is connected with a jumper wire.

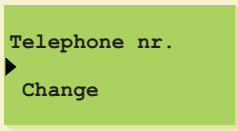
GSM modem connection is done in start functions. The controller automatically initializes the GSM modem in two hour intervals. This prevents the GSM from becoming disconnected in the event of a power failure.





Installing receivers for alarm messages:

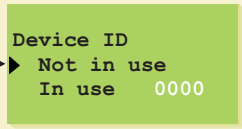
Give a telephone number that the regulator automatically sends a text message to about an alarm in the event of an alarm. At first the alarm message is only sent to the GSM number 1. If the alarm is not acknowledged from this number, after five minutes the regulator sends a new alarm to both the GSM 1 and 2 numbers.



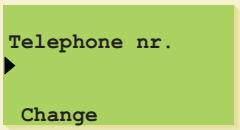
Press the button to move the cursor to "Change". Press **OK**. "O" blinks. Write the telephone number using the text editor. You can move forward or backward in the character row with the **+** or **-** button. Confirm the number by pressing **OK**, then the same number that you selected will blink in the next space. Whichever has been selected last can be deleted by pressing **ESC**. If you press the **ESC** button for a while, the number will be deleted and the number that was previously fed will remain in effect. When you are ready, press **OK** for a while (over 2 secretary.).

Device ID:

The regulator can be given a device ID, which functions as the device's secret password and address information. The device ID can be freely labeled. The device ID is always written in front of the key word when using the GSM to communicate with the regulator.



Move the cursor to "In use". Press **OK**. "0" blinks. Write a device ID that has a max. of 4 characters. The text editor has the letters A…Z and the numbers 0…9. You can move forward or backward in the character row by pressing the **+** or **-** button. Confirm the character by pressing **OK**.

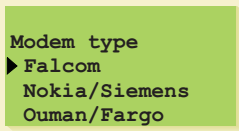


Installing the number for the message center:

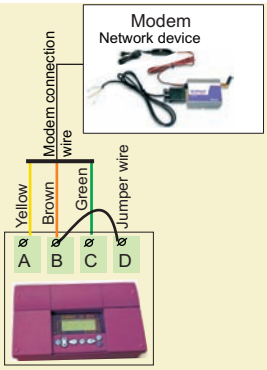
Give the operator-specific message center number with **+** or **-** button. Confirm by pressing **OK**.

Installing the modem's PIN for the regulator:

Give the SIM card's PIN. The regulator will not initialize the GSM modem before the PIN code is installed. The SIM card has to be put in the GSM telephone to change the modem's PIN. When you have changed the PIN, install the SIM card back in the modem.



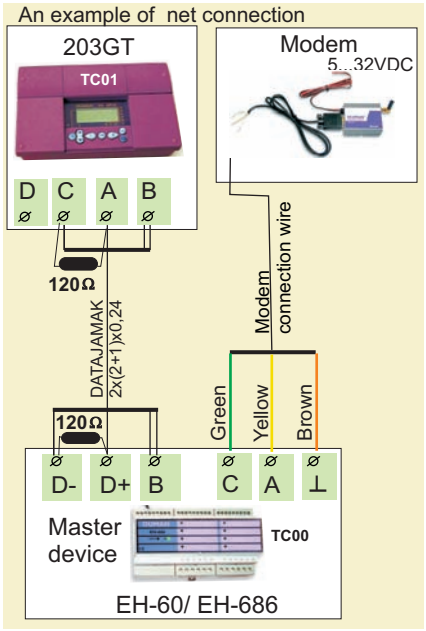
Selecting the modem type: 203GT is compatible with Falcom A2D, Nokia 30,Siemens M20T, Fargo Maestro 20 and 100 Lite and Ouman modems.



Guide for Ouman/Fargo modem connection and initialization:

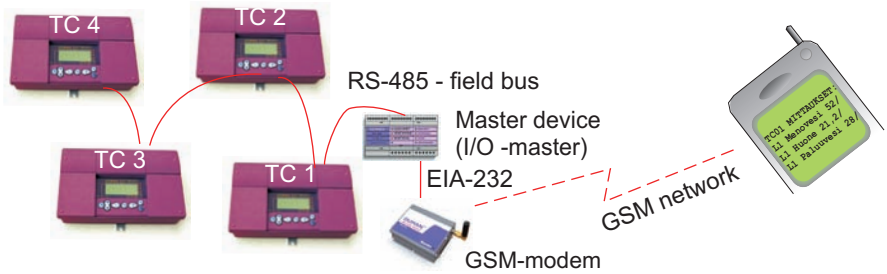
LED indicator light	Modem mode/ instructions
LED is not on:	The modem is not on. Connect the modem to the network device.
LED is on:	The power is on but the modem is not ready to use. Inspect the following: 1. 203GT has the same PIN code as the GSM modem's SIM card PIN code. 2. Perform the start-up function. To start-up, move to Start function. Press OK. Exit with ESC without changing settings.
LED blinks slowly:	The modem is ready to use.
LED blinks rapidly:	The modem sends or receives messages. If a message does not come from the controller, check the text message you have sent to see that the device ID and keyword have been written correctly. Also check that the 203GT controller has the operator's message centre number of the GSM connection you have in use. The factory setting is a Saunalahti connection.

TEXT MESSAGE SETTINGS (NET SOLUTION)



That which is presented on this page is in effect when a modem has not been directly connected to the controller. Communication occurs through the controller's RS-485 field bus. Many controllers can be connected to the system by using the EH-485 bus adapter card and a modem can be connected to the RS-485 field bus through the master device, EH-686.

An EH-485 bus adapter card must be installed in the controller so that the 203GT controller can be connected to the RS-485 field bus. (see installation and initialization guide in the instructions that come with the EH-485 card). Controllers that are connected to the bus are given a device ID (e.g., TC 1) so the system can identify which controller is being communicated with. The device ID always has to be written in front of the key word when communicating with the controller.



Directions for entering the maintenance mode are on page 21.

```
Special mainten.
 Rstore settings
 Settings
 Meas. 6 setting
 Meas.11 setting
 Dig1 selection
 Dig2 selection
 Dig3 selection
 LON initaliz
 Net measurement
▸TextMessageSett.
```

```
TextMessageSett.
▸Alarm GSM1 nr
 Alarm GSM2 nr
 Device ID
```

```
Telephone nr.
▸Change
```

Press the ▼ button to move the cursor to "Text message".
Press **OK.**

Installing receivers for alarm messages:

A GSM telephone can receive alarms and also acknowledge them. A telephone number is given here that the regulator automatically sends a text message to about an alarm in the event of an alarm.
At first the alarm message is only sent to GSM number 1. If the alarm is not acknowledged from this number, after five minutes the regulator sends a new alarm to both GSM numbers 1 and 2

Press the ▼ button to move the cursor to "Change".
Press **OK**. "O" blinks.
Write the telephone number using the text editor.
You can move forward or backward in the character row with the **+** or **-** button. Confirm the number by pressing **OK**, then the same number that you selected will blink in the next space. Whichever has been selected last can be deleted by pressing **ESC**. If you press the **ESC** button for a while, the number will be deleted and the number that was previously fed will remain in effect. When you are ready, press **OK** for a while (over 2 secretary.).

Installing the device ID:

When an RS-485 field bus is used for text message connections, the regulators are identified using a device ID. The device ID which is 4 characters long and can be freely labeled using the text editor functions as address information. The device ID is given as follows.

```
Device ID
▸ Not in use
  In use    ----
```

Move the cursor to "In use". Press **OK**. "0" blinks.
Write a device ID that has a max. of 4 characters by pressing the **+** or **-** button. Confirm the character by pressing **OK**.

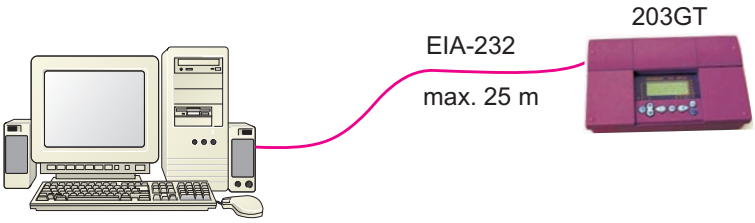
Guide for Ouman/Fargo modem initialization:

LED indicator light	Modem mode/ instructions
LED is not on:	The modem is not on. Connect the modem to the network device.
LED is on:	The power is on but the modem is not ready to use. Inspect the following: 1. EH-60/EH-686 has the same PIN code as the GSM modem's SIM card PIN code. During initialization of the GSM modem the PIN code must be 0000. 2. After the modem is connected turn the power off and then on.
LED blinks slowly:	The modem is ready to use.
LED blinks rapidly:	The modem sends or receives messages. If a message does not come from the controller/controlling device, check the text message you have sent to see that the device ID and keyword have been written correctly. Also check that EH-60/EH-686 has the operator's message centre number of the GSM connection you have in use. Saunalahti connection is a default. You can find specific instructions for connecting the GSM modem to a master device from the EH-60/EH-686 user manual under GSM modem initialization.

Direct computer connection

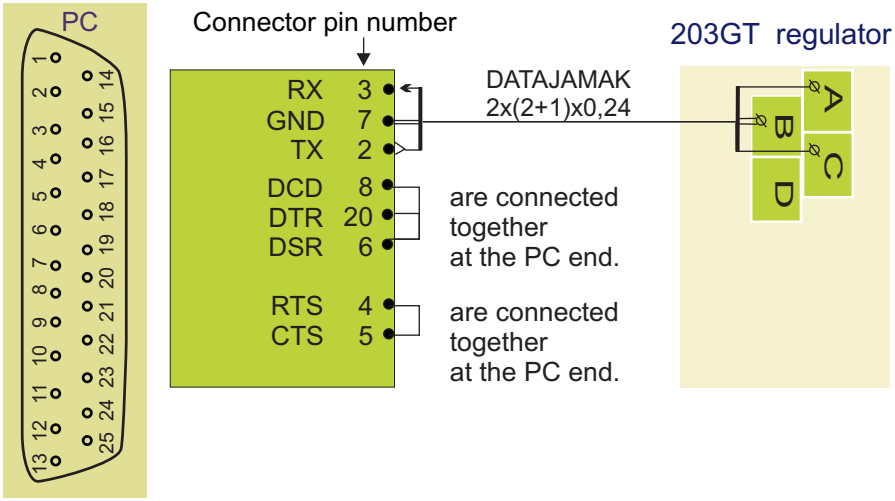
The 203GT regulator can be connected directly to a computer.

DATAJAMAK cable is used to make the connection.
Attention! If there are interferences in data transfer, try connecting the cable cover to the D-25 connnection pin no. 1 (protective GND).

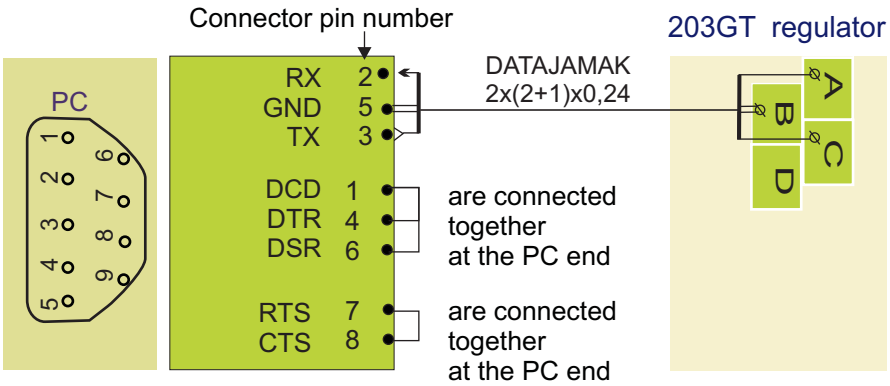


Connection guide:

Connecting the regulator directly to a PC:
D-25 connector (female)



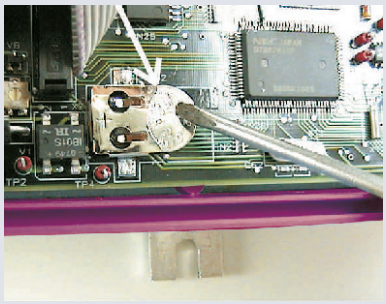
Connecting the regulator directly to a PC:
D-9 connector (female)



Changing the fuse:

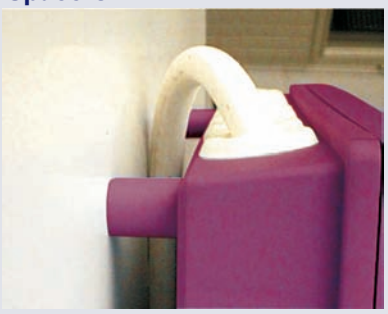
Switch off the voltage from the regul. Press the fuse socket and turn it counterclockwise. Change the 200mA (5x20mm) glass tube fuse. Press and turn the fuse socket clockwise into place.

Changing the battery:



203GT has a backup that saves the time and time program in case of a short power failure. If the time is not correct after the power failure, the battery must be changed. Battery type: Lithium button battery CR 1220, 3V. Unfasten the regulator's fuse (see the topmost picture). Carefully pry the old battery from its holder, for eg., with a thin screw driver. Push the new battery into the holder with the + end up. The old battery can be put into the garbage.

Spacers:



The cables can be routed between the regulator and installation base when spacers are used to mount the regulator.

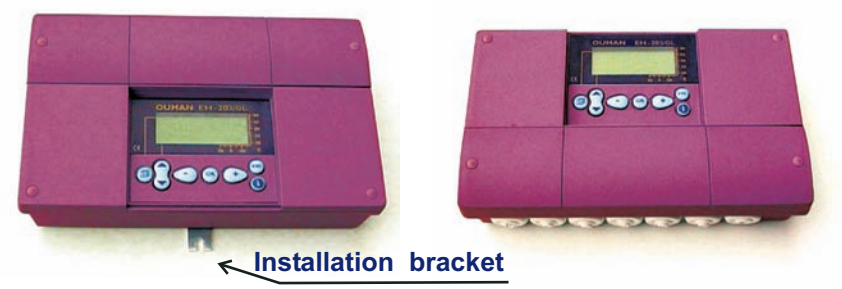
Plugs:

Complete installation by pressing the plastic plugs into the screw holes.

203GT is fastened to its mounting base with three screws (two mounting points under the cover in the connection space and one in the installation bracket.
Cables can be brought for the regulator from above (standard factory delivery) or from below. In addition, there are 6 cable through-holes in the bottom of the regulator case which can be opened, e.g., with a screw driver. Then the cables can be brought into the connection space through the bottom.

Cabling from above:
(standard factory delivery)

Cabling from below:
(turn the keyboard/display unit)



Mounting guide:

Screw the regulator to the wall using the installation bracket. Position the unit so it is level. Screw the regulator firmly into place using two screws through the connection space.

If you want to bring the cables to the regulator from below, you must turn the keyboard/display unit according to the following instructions.

Changing the cabling direction:

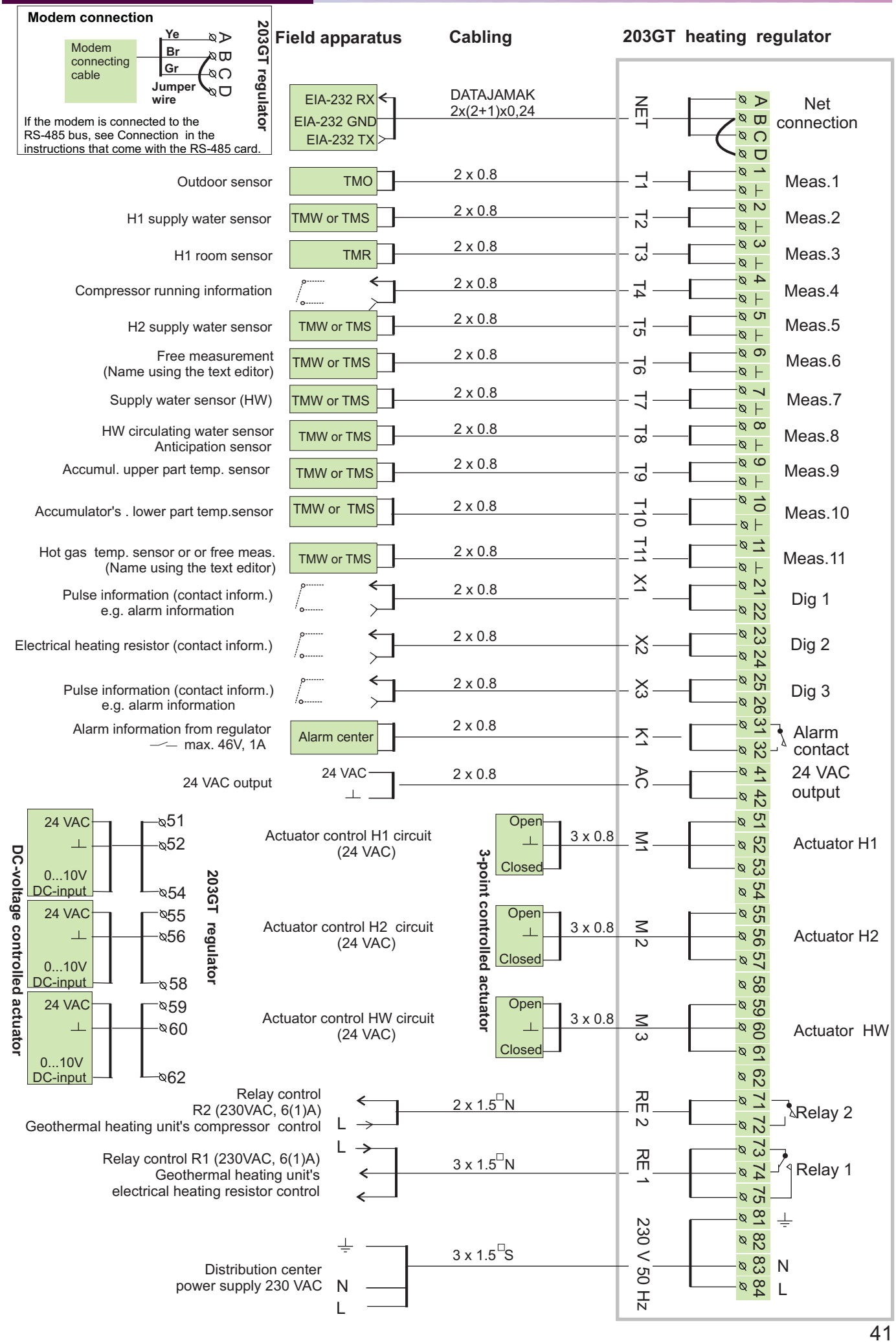
Remove the clear cover. Press as illustrated in the picture and pull the cover out of place.

Detach the keyboard/display unit carefully by prying it with a screwdriver.

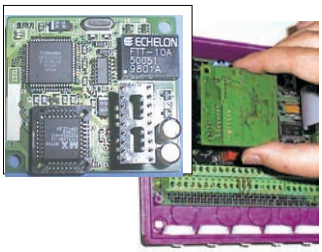
Turn the keyboard/display unit into the opposite position.

Press the keyboard/display unit carefully into place.

LÄMPÖÄSSÄ 203GT GENERAL CONNECTION DIAGRAM



OPTIONAL EQUIPMENT



LON-200

LON -200 is an adapter card which changes the 203GT regulators' serial communication bus so it is compatible with the LON field bus. An installation guide comes with the LON-200 adapter card.

EH-485

Ouman has an EH-485 bus adapter card available as optional equipment which makes the 203GL serial interface compatible with the RS-485 field bus. This offers the choice of economically connecting the 203GT regulators to the GSM-phone.

MODBUS-200

MODBUS-200 is a bus adapter card which makes the EH-203/GT serial interface compatible with the MODBUS RTU field bus. The physical interface to the field bus is galvanically isolated RS-485 network.

GSM-modem

When a GSM modem is connected to the regulator, a GSM telephone can be used to communicate with the regulator via text messages.

EH-686

An input/output unit which contains relays, analog and digital inputs as well as analog outputs. The unit makes it possible to carry out time controlled relay functions, transfer alarms using digital inputs and make an individual regulating circuit. EH-686 can also function as a master in the Ouman RS-485 bus by directing traffic in the net.

EH-net

203GT can be remotely used (browser-based) in the Ethernet network using an EH-net server. The 203GT controller must have a Modbus-200 adapter card to enable an EH-net connection.

PAN-200

With the help of panel installation kit PAN-200 the regulator 203GT is easy to install for example to the control cabin. The size of the installation hole is 222 mm x 138 mm.

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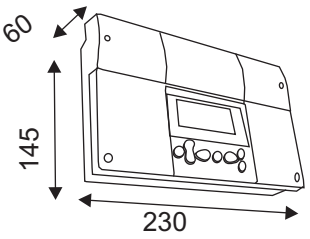
Technical information:

Operat. voltage:	230 VAC, 50 Hz, 0.20 A
Casing:	PC/ ABS
Protection class:	Without cover seal IP 41
Measurements (mm):	
Weight:	1.1 kg
Cabling direct.:	From above or below (turnable display and keyboard). Through holes on the bottom.
Regulator type:	Heating circuit's PID; domestic hot water circuit's PID + exchange + quick run
Measurements:	11 pieces (NTC 10 kΩ)
Clock programs:	max. 7 program phases/ regulating circuit (The regulating circuits have 14 all together) max. 7 program phases/ relay (begins-ends = 1 program phase)

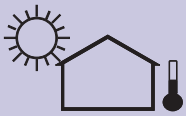
Digital inputs:	3 pieces The potential free contact is connected to the digital input (load 6...9 VDC/20 mA)
Outputs:	3 actuator control outputs 3- point 24 VAC or voltage control (0...10 V or 2...10 V) Actuator's **combined** output power **max. 22 VA**
Relay outputs:	1 break before make contact relay 230VAC/ 6(1)A and 1 norm. open contact relay 230 VAC/ 6(1)A
Alarm relay outputs	1/ 24VAC/ 1A
Information transfer connection:	EIA-232C, RS-485, MODBUS or LON
Operating temp.:	0 … +50°C
Storing temperature:	-20 … +70 °C
Approvals:	
EMC-directive	89/336/EEC, 92/31/EEC
-Interference toler.	EN 61000-6-1
-Interf. emissions:	EN 61000-6-3
Small voltage direct.	73/23/EEC
- Safety	EN 60730-1
Warranty:	2 years
Manufacturer:	Ouman Finland Oy Kempele Finland www.ouman.fi

Regulation principles:

Supply water regulation according to the outdoor temperature.

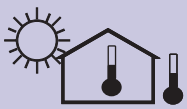
Supply water regulation according to the outdoor temperature, including the inside temperature measure-ment. (room compensation)

Supply water regulation according to the outdoor temperature, including wind compensation.

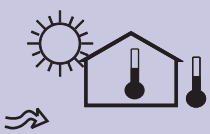


Supply water regulation according to the outdoor temperature, including sun compensation.

Supply water regulation according to the outdoor temperature, including the inside temperature measurement (room compensation) and wind compensation.



Supply water regulation according to the outdoor temperature, including the inside temperature measurement (room compensation) and sun compensation.



Supply water regulation according to the outdoor temperature, including the inside temperature measurement (room compensation) and both sun and wind compensation.

We reserve the rights to make technical changes.